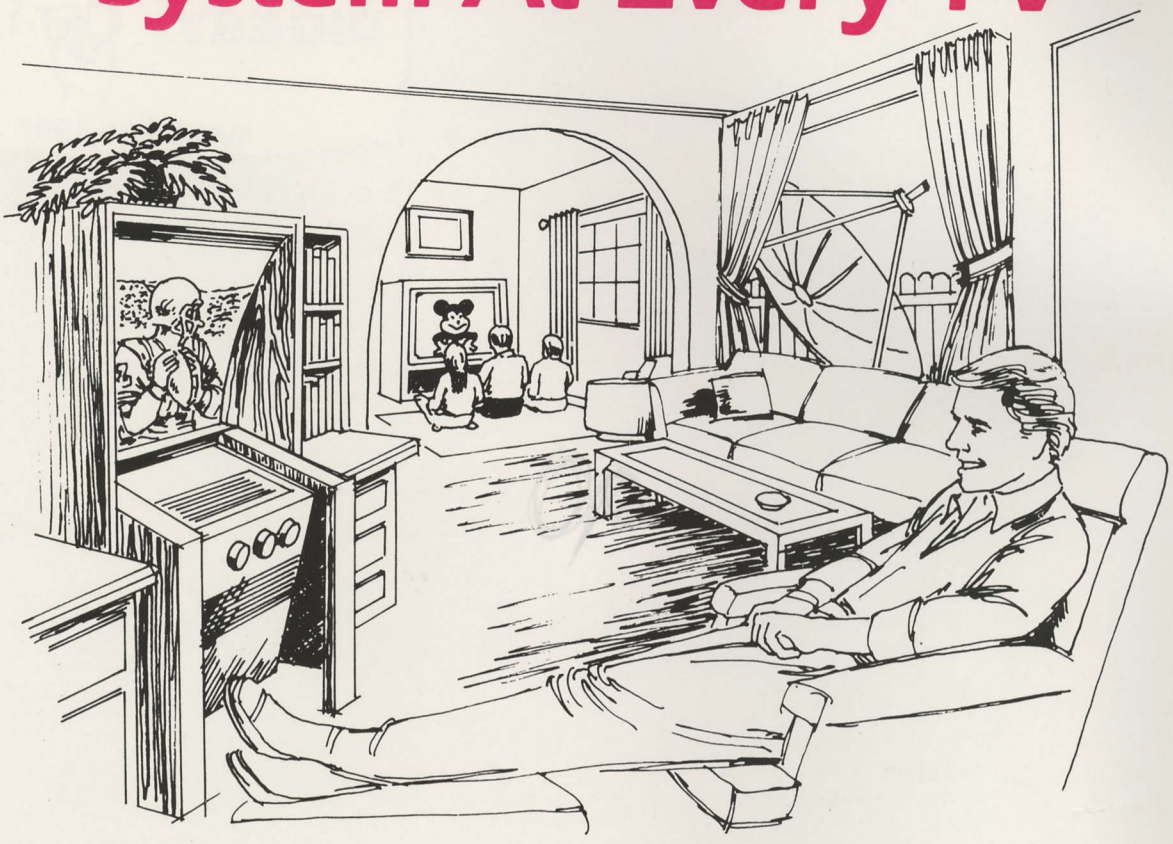
COOP'S SATELLITE DIGEST



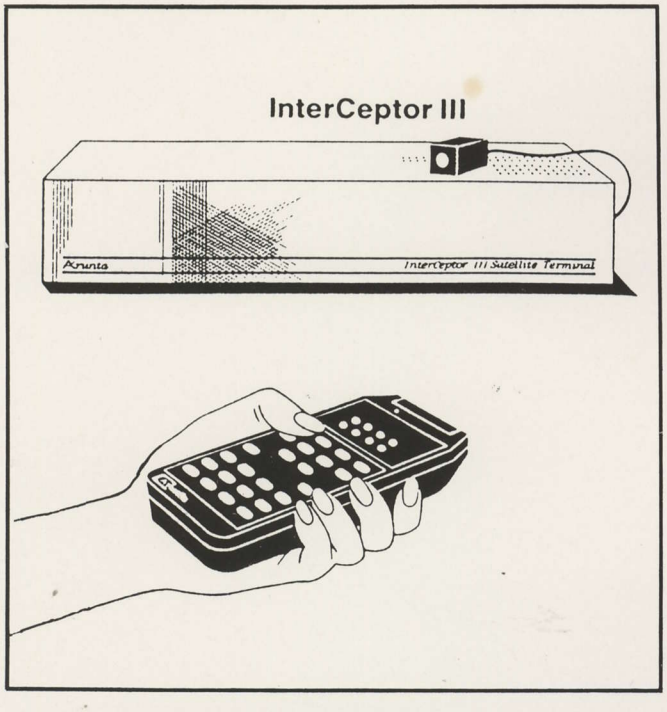
MARCH 20, 1987

INTERNATIONAL EDITION

Create a Complete Satellite System At Every TV



with Remote Sensors by Arunta Satellite



The "**World Class**" U.S.-made Interceptor III Satellite Terminal is a fully programmable C/Ku band Receiver, Stereo Processor and Actuator.

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TOP OF THE MONTH

NETWORKING. Some 18 issues back, we suggested that the number one priority facing the home satellite industry was the creation of a 'safe set' of network feeds for dish owners. Two groups have tried since then and the networks are fighting mad, and fighting back. A report.

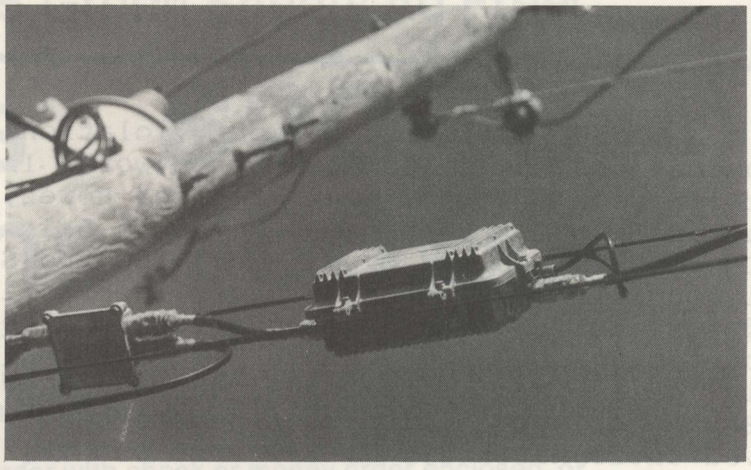
ET TU Ku? HBO now claims they will grant exclusive 'franchises' to cable system operators for the distribution of home dish programming fed via Ku band. The cable operators are not impressed. We see why.

CABLE systems construction. Our series describing the basics of building, and operating a cable system moves into the feeder line region in this issue.

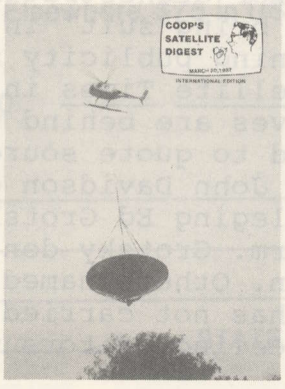
INCREASED interest in non-US satellite projects is evident in both our 'letters' and 'transponder watch' section this issue. The world is playing catch-up to the North America lead in satellite system technology and there are indications that the busiest American TVRO entrepreneurs for the balance of the 80s may be those who practice their 'trade' offshore.

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OUR COVER/ 'Darrasat' 7 meter Ku band dish being lifted to installation site on Papua New Guinea by Pacific Helicopter for reception from Aussat domestic satellite system. See report on page 26; photo by **Robert P. Darragh.**

COOP'S SATELLITE DIGEST



COOP'S SATELLITE DIGEST published on the 15th of each month, dated for the current month, by CSD, Limited, a Turks & Caicos corporation with corporate offices located at Tower Plaza, Providenciales, Turks & Caicos Islands, British West Indies. Under contract, an office is maintained in Fort Lauderdale, Fl. (**P.O. Box 100858, Fort Lauderdale, Fl. 33310; 305/771-0505**) for the contracted purpose of processing all subscriptions, advertising orders, receipt of all mail and correspondence. All communications relative to CSD operations should be directed to this office. CSD, Limited also maintains an equipment testing laboratory for satellite receiving systems and components in the Turks & Caicos Islands. CSD routinely reports on the technical performance of equipment, both privately and in print. CSD also participates in the operation of 'test tube' low power radio and television broadcasting stations and a rural area cable TV system as an ongoing research project into the challenge of bringing modern communication services to third-world, undeveloped regions. **CSD subscription rates** are $60 for 12 issues where U.S. zip codes apply, $65 in US funds in Canada and Mexico and $75 in US funds elsewhere. All non-US copies are sent via AIRmail. CSD has been published each month since October of 1979 and publisher Bob Cooper created the home TVRO industry in 1978. Single copies are $6 in US and $7 elsewhere. Bob Cooper, Jr. is publisher, CSD is copyrighted by CSD, Limited in the Turks and Caicos Islands and USA. **Second Class postage paid** at Ft. Lauderdale, Fl. Application to mail at second class postage rates is pending at Ft. Lauderdale, Fl. Direct dial telephone to CSD, Limited is 809/946-4273 but be warned; this is an expensive telephone call!

STOP-PRESS

Late News At Deadline

A LAWSUIT alleging various violations of 1934/1984 amended Communications Act filed against Network, Inc., producer of 'Boresight' television program, against Karen Howes, Shaun Kenny of Boresight, against Doctor Stephen J. Bepko of Baltimore and CSD publisher Bob Cooper. GI, joined by M/A-Com, HBO and Showtime seeks $5,000,000 in punitive plus other damages, costs, injunctive 'relief' from defendents. Suit alleges quartet involved in illegal activities centering on January Provo Descrambling Summit. GI announced suit in 'gala press conference' during SBCA/STTI trade show March 02. Bepko not served with suit papers until March 05, Cooper not served until March 09. J. Lawrence Dunham, GI, insisted at press conference all defendents had been served prior to press meeting. GI placed news stories NY Times, St. Louis Post Dispatch, numerous other papers March 04 to gain maximum exposure for their position. GI denies it is 'picking on dish industry press people' involved in publicizing descrambling news and break throughs. CSD will publish full text of suit and responses in April 15th issue.

CHUCK DAWSON of K-SAT radio satellite network insisting he is personally responsible for orchestrating GI suit, apparently believes he 'forced GI to bring suit' in complicated series of manuevers built around gaining publicity for his radio service. Another press outlet, Satellite Times in March 02 'show issue' names several people it believes are behind various clone and musketeer operations. Story failed to quote sources for allegations but publisher Doug Brown named John Davidson of Canadian firm Westar Technologies as 'source' alleging Ed Grotsky of Arunta Engineering as being behind 'X-ACT' firm. Grotsky denies claim, says he will bring libel suit against Brown. Others named say they will join Grotsky. In recent years, Brown has not carried libel insurance to protect himself against free-wheeling editors working for Brown's Triple-D publications.

RADIO-ELECTRONICS Magazine, with 250,000 monthly circulation, considering creating 'legal defense fund' to help defendents in suit with particular attention to apparent 'selective intimidation' of press in suits announced March 02. Radio-Electronics has largest newsstand distribution of any electronics magazine in America and has been publishing series on cable descramblers.

VIACOM will abandon plans to move Showtime, others to T303 in favor of Galaxy 3. COMTECH in Bahamas claims ability to 'musketeer' new VC2100 unit with 'adapters', leaving epoxy protection in place. HBO offering Ku band systems to small cable operators free if cable firms produce 50 or more new subscription homes. United Video offering Cancom package of four Detroit net signals to US cable firms at 70 cents per month per home. PrimeTime 24 now fulltime scrambled using Videocipher; F2R.

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- **SUMMIT Humor**
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REVIEW

When I sat down immediately following the close of the Summit to prepare February's CSD, I knew it would be a difficult issue to create. First there was the 'information overload' problem. After sitting or standing through perhaps 40 hours of lectures regarding descrambling and scrambling, I had a tremendous amount of data to mentally file and try to straighten out. Did you know, for example, that there are purported to be five different 'ground levels' on the VC2000 descrambler module varying from 0 ohms to nearly 100 ohms? It makes a considerable difference when you are poking around device pins with even an isolated, high impedance scope or measurement tool to know where the various ground potentials exist.

Second, there were the loose ends. Although we did sort out the mystery of the miraculous 'European Chip' (see report page 23, February issue), what about those various devices promoted but not shown at the Summit? What about the fellows in Phoenix who were hauled before a federal court and who then mysteriously ended up doing some sort of plea bargain to get off scott free? Was the same GI that was 'cooperating with U.S. Customs' to push seminar attendees into threatened strip searches letting the chaps in Phoenix off without a fine or jail sentence if they promised not to sell any more chips?

Third, there was the obvious connections between the various chip disciplines. As we reported here in February's CSD, one unit ID number extracted from a borrowed box last fall ended up being found in dozens of different chip samples from coast-to-coast two months later. How did that **one number** manage to get spread so widely, so fast? Was there somebody involved in the original cloning exercise who was selling cloned numbers 'out the back door' to set up cloning cells from the Bahamas to Hawaii? A true mystery.

Fourth was the unknown reaction of GI, and the U.S. Customs. Our own attorney, hired sight-unseen over the telephone, told us in no uncertain terms "It would be unwise for **you** to return to the United States". 'Now, **or ever** ...' we asked.

Fifth, how long would GI take to accumulate all of those musketeer and clone 'master' or 'unit' numbers into one set of computer address instructions so all could be turned off in one perhaps dramatic ceremony? Confiscated chips from Fort Lauderdale were a direct trail to those units the chips were designed to function with. So too were the chips from units detained by Detroit (and perhaps other) entry points; those chips coming in from Canada.

Ahead were additional unknowns.

"**I have seen and picked up the new Videocipher module**" reported an attendee who works for a major distributor. "It weighs two or three pounds more than the previous module". That strongly suggested, if true, that the additional weight would be some form of encapsulation; a material spread over the module circuit board (or sections thereof) to prevent undisciplined entry to the board. At least one cloning advocate had the potting counter-counter measure figured out.

"Cut out pin 1 on the keyboard and clone directly from the edge connector. This will require making up a jig, similar to what I expect is used at the factory. With an IBM PC, a card cage and a signal generator we will produce new key pad codes feeding in data as simulated Videocipher data." Perhaps, but it was sounding more and more complex with each counter measure step from GI.

There would seem to be a level of hassle which GI can tolerate. Making the cloning or musketeer process more complex will drive up costs associated with each operation, perhaps drive up the cost of the finished chip products (although there is certainly a comfortable 'margin of profit' at the present time). It will also reduce the number of players since the initial cloning and musketeer sellers quickly educated far less competent people in the same art because all it took was a small computer and EPROM burner (musketeer) or an EPROM burner alone (cloning) to duplicate chips. At some point, GI will have controlled the major outlets for chips and after a sufficient number of people have lost money because their chip-activated units were discovered and turned-off, the willingness of the market to use chips will drop off. If GI keeps up the pressure, all of this is inevitable.

"**If people lose general confidence in Videocipher**, and the cable programmers are forced to switch off to another and perhaps more complex system, there is no way of predicting the ultimate outcome. It might help the home dish market; it could just as easily destroy what is left of the market."

Still others are concerned that there is already 'no marketplace left'; that the industry has shrunk to the

point that it can no longer feed itself and stay alive. Estimates of the 1986 unit sales go as high as 250,000; and as low as 150,000. The number of units, a distinct problem, is not 'the problem'; profit on sales is.

In their annual look at the industry, one of the surviving firms (**Luxor North America**) writes about the condition of the marketplace. I like **Hans Giner** and while he may on occasion be accused of being overly optimistic, his views on what the industry is turning into are worth repeating. I quote somewhat out of context and freely admit it:

> "**The severe industry decline has bottomed out**, the sales curve is moving up and people are buying home systems. Media coverage is more positive and consumers are better informed about home satellite TV".
>
> "**Today's customers** want more and better programming. That is what the back yard satellite industry must sell."
>
> (in the past) "the industry failed to publicize the benefits of satellite TV. Before scrambling, satellite TV systems sold about as fast as they were produced. Few pre-scrambling voices called for media and public education. Most producers and sellers were too busy selling (and) sadly, many are now out of business."
>
> "**Introduction by some manufacturers** of IRD-type satellite TV receivers with integrated or built-in decoders demonstrates an optimistic outlook."

It should be noted that Luxor has not yet made a decision to produce an IRD version receiver. He notes "Luxor is not convinced the high cost of such equipment will appeal to many in today's marketplace".

The same Luxor analysis suggests that the average price per home system in 1986 jumped from $1,500 in 1985 to $2,000 in 1986. It may be of interest to observe that the $500 differential corresponds to the consumer price for a VC2000 descrambler. Does this mean that people were willing to pay $500 more for a system in 1986 than 1985 because it **did include** a descrambler? Or, because people still buying systems were buying more complex/sophisticated systems which simply cost more?

Early pricing for IRD type receivers, **with** a descrambler included, is more than $1,000 greater than a quality basic receiver **without** an IRD module. We have been told that the IRD units cost the receiver manufacturers $150 so that leaves $850 of the price increase buried someplace else. Designing a receiver to accept the IRD unit adds some money to the basic receiver; CSD did an extensive analysis of this in our April, May and June 1985 issues.

Much of that $850 **is** in 'profit', or hoped for profit. That means that when push comes to shove, the price on IRD receivers that pile up in warehouses could plummet downward rapidly in $100 or $200 drops. When a receiver manufacturer gets really hungry, he'll slash his considerable profits just to move merchandise.

The scenario being played out at this time is quite complex. Consider these issues:

1) VC2000 descramblers were all bought up in the marketplace in January. The market topped out in the $475 and up region around the 21st of January in 50 lot quantities just as the last of the in-stock units disappeared into distributor 'hoardhouses!'
2) IRD units, at $1300 or so each, **suddenly** became available. Would a dealer be forced to pay $1300 for an IRD receiver or would he be willing to pay a $200 premium for a VC2000 that someone was hoarding in a warehouse? Time would tell.
3) If the older style VC2000 descramblers had been purchased and were being stored in warehouses because people perceived they would have a special 'advantage' for musketeering and cloning, at what point might these older style units once again surface in the for-sale market? How long would distributors sit on these expensive relics before they started offering them for sale once again?



COMTECH DATA SHEET giving address and telephone numbers in Nassau, The Bahamas was widely distributed during Summit. Telephone numbers did not work and firm was not delivering 'Video Enhancer' **product at 'show'.**

I like the word 'conspiracy' here. Those who attended the Descrambling Summit were accused of 'conspiring to defeat a law-protected scrambling system'. **What about those distributors** who glommed onto 1,000 lots of VC2000s for only one apparent purpose; to rathole older style units which have the ability to be 'doctored' for illegal musketeer or clone reception? Are these people playing the descrambler 'futures market' not also conspiring to make money on the defeating of the scrambling system? How are these distributors any different than those who make musketeer chips? One has to wonder how many of the 'name' distributors rat-

COOP/ continues page 27

BE A CABLE OPERATOR (Part 7)

OVERCOMING Loss

The cable system is basically a giant loss machine. Proper operation of a cable system involves simply balancing 'losses' and 'gains' so that at no point in the system do the losses overcome the gains. Every foot of cable in the system adds loss. Loss is therefore 'spread' throughout the plant quite evenly. Gain, on the other hand, comes in clumps or lumps; at each amplifier 'station'.

All amplifier stations have basic ratings:

1) Gain capability (in dBs)
2) Frequency response (in megahertz of bandwidth)

All electronic systems, just like satellite receiver systems, have their own 'noise levels' or thresholds caused by the electronic amplification process. In the TVRO world, we measure or judge noise based upon the 'Kelvin' (or degrees K) noise scale. Everything in the cosmos has measurable noise; even deep space itself has a noise factor of approximately 4 degrees Kelvin. There is **no noise** only when all electron motion stops. Your body, for example, has a noise level of around several thousand degrees Kelvin; a quite separate measurement from the 'temperature' of your body.

In the cable world, a more ancient noise measurement system is in use. Noise Kelvin is the **same as** 'noise dBs' except there are two different scales involved. It is like comparing physical temperature centigrade and physical temperature fahrenheit. The cable systems refer to so many dB of 'noise figure' where the term 'noise figure' equates to some number of 'dB stated noise units'.

Signal to noise ratio is simply a comparison of ratio. You have so many dBs of noise to begin with and you have so many dBs of signal. The ratio between the signal (the good guy) and the noise (the bad guy) is expressed as the 'signal to noise ratio'. Large signal to noise ratios are preferred. A high quality commercial TV camera may have a signal to noise ratio of 57 dB. That means that the picture coming out of the camera is 57 dB greater than the noise coming out of the camera. Since it is the television camera at the start of the telecast that establishes its own signal to noise ratio, at no point between that camera and the ultimate viewer's television set can the signal to noise ratio ever be better than the camera's signal to noise ratio. In other words, the best possible picture originating in that camera, no matter where it is involved along the chain from camera to TV set is 57 dB signal to noise ratio.

In the real world, the camera's signal to noise ratio (whatever it may be) is degraded even before the signal gets into the air or out of the uplink transmitter on the way to the satellite. Each piece of electronic equipment that amplifies or processes the camera signal adds its own noise to the picture. This degradation continues through the satellite, through the satellite receiver, through the cable system headend modulator, and then through each amplifier in the cable system ahead of TV set. Even the television receiver contributes to the degradation since the tuner in the TV set also has a 'noise figure' of its own.

In the same 'real world', one attempts to deliver a signal to the TV set tuner that has at least a 40 dB signal to noise ratio. This number (40 dB) makes some not always valid assumptions:

1) It assumes that the TV set has a low enough internal noise figure that it can still properly process a signal with a 40 dB 'ratio' and produce clean pictures;
2) It assumes that everything ahead of the TV set, from TV camera to the last cable amplifier, is operating with the best-design-possible signal to noise ratio.

A picture that is 'busy', fine-grain like 'noise' moving on solid reds and blues and greens, has a noise problem. This noise can be coming at any stage in the line from camera to TV tuner and it is appropriate here to note that lots of signal 'voltage' is not the same as a high signal to noise ratio.

With a spectrum analyzer or cable television signal level meter (SLM) you can measure, accurately, the **signal voltage level** of the TV signal in question. This is done channel for channel (ie. frequency for frequency). The same instrument, an SA or an SLM, can also measure the system 'noise level'. The usual process is to first measure the TV carrier voltage (signal) level and turn off the modulator for that one channel and measure the residual 'voltage' remaining. You cannot simply 'tune between' TV carriers with an SLM and measure what you **think** is noise (ie. the lack of signal between channels) because there is sideband or lower level signal energy **between each channel** which only goes away if you

turn off the modulator(s) in that frequency vicinity.

Let's say you measure at a point in the cable plant a signal level at your test point of +10 dBmV. Then you turn off the modulator for that channel and the frequency where the signal was reading drops to -30 dBmV. That's a ratio of 40 dB (signal to no signal). The -30 dBmV voltage level measured should have been just the cable system noise. But is it?

Remember that while each modulator in the system is designed to produce output signal on only one channel or frequency, it does emit 'garbage' (unwanted signal voltage) on other frequencies as well. In fact, one of the technical criteria of a modulator is the measured amount of output on unwanted frequencies (less is better). So when you turn off the modulator on say channel 7, and attempt to measure the 'noise' remaining you may be measuring noise plus 'garbage'. As far as the viewer is concerned, that 'garbage' from other modulators has the same effect as pure noise; it degrades the picture on the screen. In this instance our 40 dB 'ratio' may not be a simple 'signal to noise ratio'; it is more appropriately a 'signal to noise **plus garbage** ratio'.

All of this means that the ratio between satellite signals, created in the cable by the modulator, and set by TV camera or videotape deck back where the telecast originates is a very fragile commodity. And just as the signal to noise ratio can never be better than originated by the camera, it also cannot be reestablished (or improved upon) if it once drops to a new lower number. It is the job of the cable plant planner and the cable plant amplifiers to see that the degradation (addition of noise) at each amplifier station is not excessive.

TYPES Of Loss

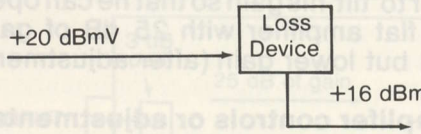
The cable plant has loss. Each foot (or inch) of cable, each cable connector, each passive device (such as a line splitter or tap) causes loss. There are two types of loss; flat and frequency sensitive.

Flat loss occurs when the signal voltage is divided into parts. A two-way splitter is a good example; you start off with 100 'units' of signal and you divide the 100 units into a **pair of equal parts**. That suggests you will have 50 parts in each side of the splitter. Unfortunately, a two-way splitter is not 100% efficient so some of the 100 units are lost in the splitting process. If 100 is our starting point, we will end up with around 45 in one side, 45 in the other side and 10 are lost in the splitting process.

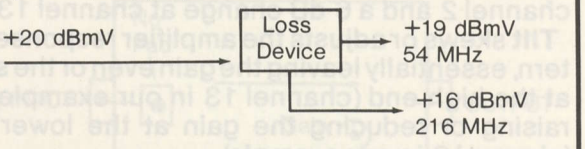
Flat loss affects all frequencies or channels equally. If channel 2 is split in the splitter, whatever its signal voltage level **before** the splitter will arrive at the output of the splitter in two-equal parts. The same will apply to all other channels in the system.

TYPES OF LOSS BETWEEN AMPLIFIERS

Flat Loss:
1) Line splitters
2) Power inserters/power supplies
3) Taps (some variation)
4) Directional Couplers
5) Splices/connectors (some variation)



Frequency Sensitive Loss (greater on higher frequencies):
1) Old style pressure taps
2) cable (all types)



THE CABLE system has two types of loss; flat (same at all frequencies) **and frequency sensitive** (more at higher frequencies).

Line splitters, power inserters, signal taps, directional couplers, splices and connectors all have 'flat loss'.

Frequency sensitive loss is not 'flat'; it varies with the operating frequency of the signal. Cable loss is the largest single loss item in a cable plant, and as we have learned, there is more or greater loss at higher frequencies (cable channels) than at lower frequencies or channels. If 100 units of channel 2 signal and 100 units of channel 13 signal go into a 1,000 foot length of cable, you could get 50 units on channel 2 and 10 units on channel 13 out at the end of the cable. This frequency-dependent loss is an inherent design problem with all cable plants. Somehow there must be an allowance or 'compensation' for frequency dependent loss (also known as tilt loss).

Compensation is built into each of the amplifier locations or 'station'. The most common way to compensate for uneven (tilted) cable loss is to design an amplifier which has more gain at the higher frequencies (channels) than at the lower frequencies (channels). If you know, for example, that a typical amplifier station will be 1,000 feet removed in cable from the preceding and following amplifier stations and if you know that in 1,000 feet of cable there is 10 dB more loss at channel 13 than at channel 2, the amplifier is then designed to produce 10 dB additional signal gain at channel 13.

Such an amplifier may be 'rated' for 25 dB of gain.

What that really means is that the amplifier has 25 dB of gain at the **highest** design channel (such as channel 13) but proportionately less gain at the lower channels (such as 15 dB of gain at channel 2). Some amplifiers come from the factory with this design while others have 25 dB of gain 'flat' across the full band, and inside of the amplifier are controls or adjustments which allow the installer/operator to 'tilt' his gain so that he can operate the 25 dB flat amplifier with 25 dB of gain at channel 13 but lower gain (after adjustment) at channel 2.

Typical amplifer controls or adjustments are shown here.

Gain raises or lowers the full unit gain across the full frequency band. It may **not** do this evenly (ie. turning the control could make a 2 dB change at channel 2 and a 6 dB change at channel 13).

Tilt skews or adjusts the amplifier response pattern, essentially leaving the gain even or the same at the high end (channel 13 in our example) but raising or reducing the gain at the lower end (channel 2 in our example).

A pad is a plug-in device, small in size, that allows the operator to 'short space' the amplifier beyond the range of its gain control. Perhaps in our example we have to locate an amplifier 600 feet from the preceding amplifier. For reasons we will better understand shortly, that is too close to the preceding amplifier so we need some method of reducing the input level to our short spaced amplifier. The pad, just like a pad in TVRO work, does this; it attenuates or weakens the cable line signal equally across the full frequency spectrum; channel 2 to 13 in our example. Plug-in pads insert into tiny receptacles in the amplifiers with various 'pad values'; 3 dB, 6 dB and so on are typical values. You select the value pad that corresponds most closely with the amount of signal reduction in that location.

Other adjustments or set and forget controls inside of the typical cable amplifier include:

AC Powering/ cable amplifiers are powered by a nominal 30 or 60 volt AC line voltage carried by the coaxial cable. The power to the amplifier can arrive through either amplifier 'port'; ie. the input or the output. Adjustments, switches, connecting wires inside of the amplifier allow the installer to decide which direction the power comes to the unit from, and whether the power goes in but stops at that amplifier location, or goes on to the next amplifier location in the chain.

AMPLIFIER Spacing

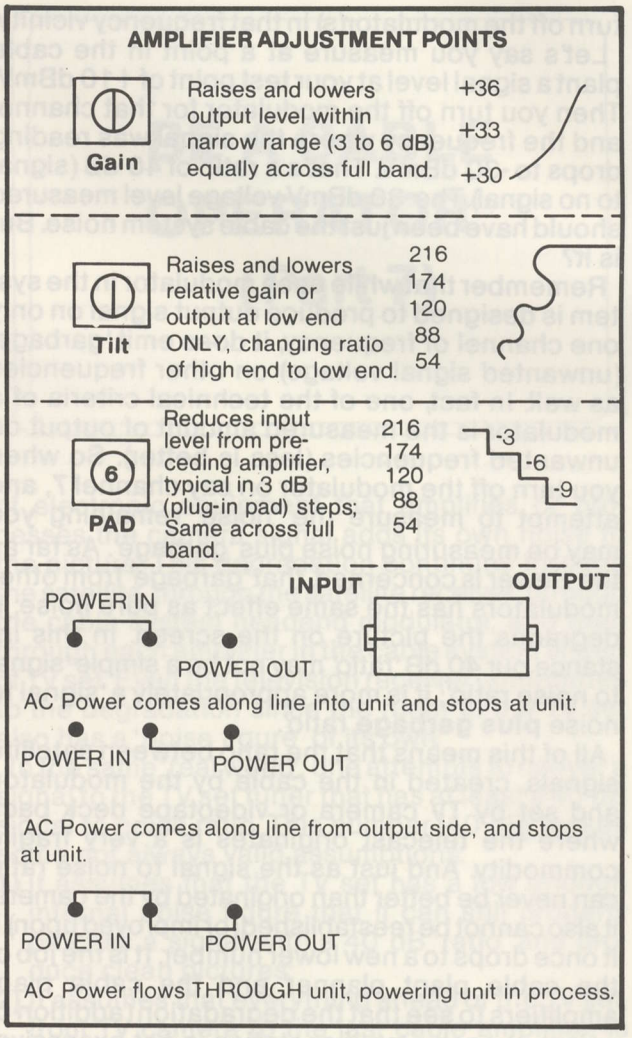
A cable line amplifier has specified operating parameters. We know one; 'gain'. There are two others of interest at this point:

Input level / The manufacturer/designer tells you what the minimum input signal voltage level (on the highest channel) shall be. A number such as +7 dBmV is typical for a 'trunk' amplifier. That means the manufacturer wants you to arrive at ('hit') the amplifier with no less than +7 dBmV of signal. Why?

Remember our discussion of signal to noise ratio? We found out that every amplifier produces noise; some measurable amount of noise. If we are trying to maintain some minimum signal to noise ratio within the cable plant, and we can calculate or measure the trunk amplifier noise level, we then can calculate how low in signal we can drop before we lose our ability to maintain a 40 (or better) dB signal to noise ratio.

The manufacturer telling you that the input signal must be no lower that +7 dBmV is saying in effect "**At this input level**, you will not degrade your system signal to noise ratio by a perceptible amount."

Output level / the manufacturer/designer also tells us how much output 'capability' there is in the amplifier station. We know the gain (25 dB in



our example) and we also know the minimum input. But suppose the amplifier is 'short spaced' and our input level is not +7 dBmV but rather it is +20 dBmV. Then what?

The output level is related to the input level. If we have 25 dB of gain capacity, and an input level of +7 dBmV, then the maximum output we can achieve is 7 + 25 or (+) 32 dBmV. But with the same 25 dB of gain, if we have an input of +20 dBmV, now we have the capacity to produce an output of 20 + 25 or (+) 45 dBmV.

Too much signal causes an amplifier to distort; 'overload'. That means one set of channels starts to 'cross talk' and walk all over another set. Typically, because of the system 'tilt' the stronger, higher channels (7-13) start cross talking on the weaker, lower (2-6) channels. This 'cross modulation' instantly degrades the pictures and once it occurs there is no way to cure the problem later on in the system. The signals have been 'married together' in a way that cannot be corrected unless the amplifier where this is occurring is level-corrected.

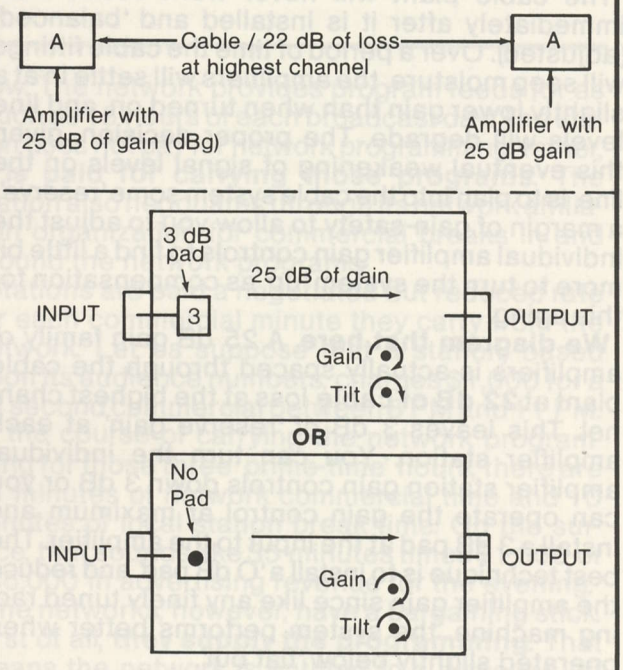
Remember the 3, 6 or 9 dB pad we had as an option for our previously discussed (short spaced) amplifier location? Here is where we use such a pad, to make sure the 'output capability' of the amplifier is not exceeded by bringing to the amplifier too much signal.

A 25 dB gain amplifier is a pretty common amplifier. Now, do you figure out the loss in the cable and then place each successive amplifier precisely 25 dB of cable loss after the last amplifier? Not wise.

First of all, as we shall later see, some of the loss may be 'flat' (a trunk line splitter for example) and some may by frequency sensitive or tilted. The system loss is always highest at the highest channel so all calculations are based upon the highest channel and the loss at that channel.

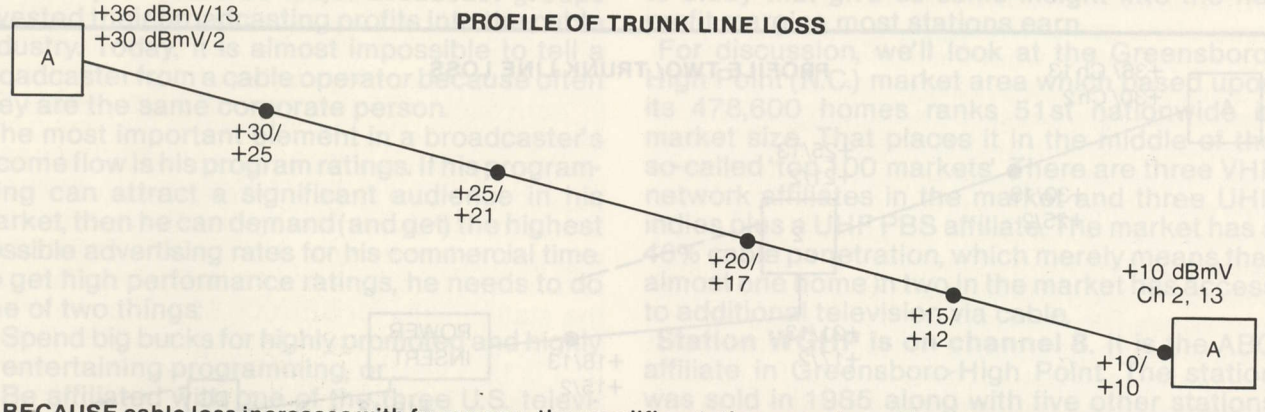
If we calculate all of this and then insert the next amplifier station at the 25 dB (of loss) point for the highest channel, we will have to operate that amplifier station at its full, rated output (gain max-

MECHANICS OF AMPLIFIER SPACING



BY BACKING off of 'operation gain, 3 dB, a reserve is established. You may do this by 'padding' of the input, 3 dB, and turning outout level up to maximum, or, running full input into amp and turning down output gain control (3 dB).

PROFILE OF TRUNK LINE LOSS



BECAUSE cable loss increases with frequency, the amplifier station operates with greater output level at channel 13 than at channel 2. This ratio (6 dB in example) **closes along the pathway to the next amplifier 'flat'; +10 dBmV in our example.**

imum) from day one. Again, not wise.

The cable plant will never work better than immediately after it is installed and 'balanced' (adjusted). Over a period of time the cable fittings will seep moisture, the amplifiers will settle in at a slightly lower gain than when turned on, and line levels will degrade. The proper decision, given this eventual weakening of signal levels on the line, is to plan into the cable system some 'reserve'; a margin of gain-safety to allow you to adjust the individual amplifier gain controls to find a little bit more to turn the system 'up' as compensation for this aging.

We diagram that here. A 25 dB gain family of amplifiers is actually spaced through the cable plant at **22 dB of cable** loss at the highest channel. This leaves 3 dB of 'reserve gain' at each amplifier station. You can turn the individual amplifier station gain controls down 3 dB or you can operate the gain control at maximum and install a 3 dB pad at the input to the amplifier. The best technique is to install a 'O dB pad' and reduce the amplifier gain since like any finely tuned racing machine, the system performs better when operated slightly below 'flat out'.

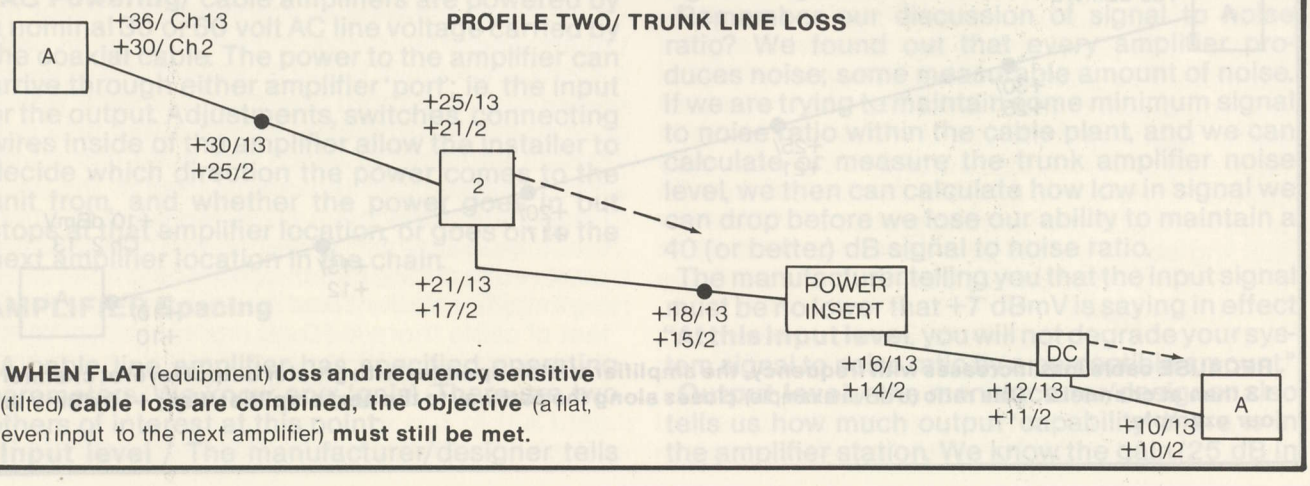
A typical trunk line signal voltage profile is diagrammed here. We leave the first amplifier station (**A**) with a signal voltage of +36 dBmV on channel 13 and +30 dBmV on channel 2. This is the 'tilt' identified earlier; greater output on the higher channel because we are compensating for the higher cable loss between this amplifier and the next one, at the higher frequency.

Five measurement point are identified in the diagram. At the first, the levels are +30/25 (30 being channel 13, 25 being channel 2). Note that we have lost 1 dB more signal at channel 13 than at channel 2 in this first increment. This process continues; +25/21, then +20/17, then +15/12 and finally as we enter the input to the next amplifier in the string ('cascade') we have +10/10. In other words, while we left 'A' with a 6 dB 'tilt' we arrive at the next amplifier (lower right) with an even signal (+10 dBmV) on both channels 13 and 2. This is called 'tilted **output**/flat **input**'. There are good engineering reasons for 'entering' an amplifier 'flat', or even across the full cable band.

In a more typical situation, we see in '**Profile Two/ Trunk Line Loss**' that both types of loss are commonly combined between the output of one amplifier and the input to the next amplifier. Our example shows the same starting basis; +36/30 dBmV for channels 13 and 2. At the second measurement point there is a trunk line split where the input to the splitter is +25/21. The output, after the flat loss and the inefficiency losses of the splitter itself, becomes +21/17. After the splitter is a power inserter; a device that places the AC cable powering voltage on the (trunk) line. It is essentially passive (ie. it has no active 'RF' or cable frequency parts) but it does add loss none the less. This loss combined with the cable loss (tilted) after the two-way splitter is 2 dB 'flat'. Finally there is a directional coupler, a splitter designed to have more loss on one side than the other. Ultimately we end up at the input to our next trunk amplifier with the same +10/10 input levels, flat across the cable channels.

The basis for all of this is that each loss device, or each element in the trunk line portion of the system must be considered and the loss calculated as a part of the exercise in placing amplifiers 'on paper' for the cable system. Cable loss per 100 feet (or foot) originates from the cable supplier. These losses vary as a function of frequency and your highest cable channel determines the maximum loss and therefore the basic loss for the spacing between amplifiers. To this must be added any 'flat' or bulk loss accumulated with passive devices inserted into the trunk between amplifier stations.

The trunk line is planned to be and intended to



WHEN FLAT (equipment) **loss and frequency sensitive** (tilted) **cable loss are combined, the objective** (a flat, even input to the next amplifier) **must still be met.**

be quite stable. Its signal voltage levels are kept as stable as possible so that the customer service or feeder lines can operate properly. We'll visit that portion of the plant design as this series continues in CSD.

THE NETWORKS GIVETH... AND TAKE AWAY

THE VALUE OF Network Affiliation

Each year the FCC, as official watchdog agency of the communications world, releases a set of numbers reflecting the dollar volume in the American radio and television broadcasting business. These are big numbers; the types of numbers usually reserved to foreign appropriations or new jet fighter contracts. The broadcasting business is one of the most profitable in American and those who are a part of this relatively small club will spend extraordinary funds and no end of legal talent to keep their present day winnings.

The cable industry is approaching the same sort of numbers, rapidly. Some twenty years ago, cable operators were cable operators and broadcasters were broadcasters and the two did not mix. Ten years ago there was a decided change in the ownership of cable as major broadcast groups invested their broadcasting profits into the cable industry. Today, it is almost impossible to tell a broadcaster from a cable operator because often they are the same corporate person.

The most important element in a broadcaster's income flow is his program ratings. If his programming can attract a significant audience in his market, then he can demand (and get) the highest possible advertising rates for his commercial time. To get high performance ratings, he needs to do one of two things:

1) Spend big bucks for highly promoted and highly entertaining programming, or...
2) Be affiliated with one of the three U.S. television networks.

Network affiliation is an extremely important ingredient in a station's gross income, and cash flow. The network provides program feeds for as much as 15 hours of each broadcast day. The station does not pay for network programming; rather, **it is paid for carrying those programs**. The station also negotiates through its network affiliation organization for commercial breaks in and around the network programs.

Stations are paid a negotiated but reduced rate for each commercial minute they carry from the network. Let us suppose that a station, based upon its audience numbers, charges $1,000 for a 60 second commercial between 8 PM and 11 PM. In the course of carrying the network programming for those three 'prime-time' hours, there are 25 minutes of network commercial time and 10 minutes of local station break time. On the surface, that sounds like 35 minutes times $1,000 or $35,000 in advertising revenue for the evening.

The networks, however, have a bargaining stick. First of all, **they supply the programming**. That means the network is entitled to a discount, off the $1,000 station rate. This discount varies but in most instances the stations realize 35 cents on the dollar when all of the network discounts are taken. The network also 'delivers' the signal or programs to the affiliate's operations center, at the network's expense. So the station, in our example, for our 25 minutes of network commercial time realizes $350 per 60 second commercial or $8,750. The 10 minutes available to the station itself, which it sells locally, earns the station the full rate or $1,000 per minute. The station, then, ends up with $18,750 gross income for the three hour period.

Network affiliate profits vary from station to station, and market to market but there are examples to study that give us some insight into the net profit margins most stations earn.

For discussion, we'll look at the Greensboro-High Point (N.C.) market area which based upon its 478,600 homes ranks 51st nationwide in market size. That places it in the middle of the so-called 'top 100 markets'. There are three VHF network affiliates in the market and three UHF indies plus a UHF PBS affiliate. The market has a 46% cable penetration, which merely means that almost one home in two in the market has access to additional television via cable.

Station WGHP is on channel 8. It is the ABC affiliate in Greensboro-High Point. The station was sold in 1985 along with five other stations owned by the same television station group owner for $30,500,000. WGHP alone has been recently resold for $55,000,000. This is not a case of the

parts being worth more than the whole; television station prices have been shooting up rapidly of late and between 1985 and 1987, it is conceivable that the value attached to the station has become almost twice what the station **and** five sister stations sold for as recently as 1985.

Now, how would a single VHF television station in the 51st market of the United States be worth $55,000,000? Good question. First, let's look at what the station consists of.

Its balance sheet for December 31, 1986 lists the following:

1)	Cash and securities	$157,600
2)	Net receivables (money owed to station)	1,972,800
3)	Broadcast program rights	3,894,700
4)	Other current assets	62,400
5)	Net property and equipment	12,041,800
6)	Program rights - long term	1,481,400
7)	Contract licenses and goodwill	18,288,000
Total assets		$33,986,100

You will quickly notice several important things. First, the station's total assets are a 'mere' $33,986,100 while the station has been sold for a reported $55,000,000. Second, of the total assets, $18,288,000 is assigned to 'good will'. That comes to 53.8% of the total valuation. If you reassess the actual value or hard assets of the station against the most recent $55M selling price, the 'hard assets' of $15,698,100 (ie. subtract out good will) leaves only 28.5% of the new selling price for hard assets.

Hummm. There is obviously some 'magic' in the broadcasting business which defies normal business logic.

CASH Flow

In the cable television business, 'cash flow' is the name of the game. The big time cable hitters are interested only in what the system will generate in excess revenues, above normal operating expenses. That's because if a cable system throws off excess cash (ie. cash it does not need itself), then that extra cash becomes a business 'tool' with which the cable operator can leverage himself into additional cable properties. And if the system generates sufficient cash flow, he can leverage himself into the same sort of situation all over again. The trick is to not indebt yourself for the purchase of a cable system so badly that there is no cash flow left to re-invest after you pay your operating expenses and repay the debt you leveraged to buy the system in the first place.

Broadcasters have learned this lesson from cable, slowly. Cable operators 'discovered' this method of business evaluation early because the gross income from an operational cable system tends to be very predictable. If you have 1,000 subscribers this month, the odds are excellent (like 9-1) that you will have no fewer than 1,000 next month. And in a year, you will have 1,100. The cable system income stream is predictably steady and predictably upward in movement.

Cable gets this unique advantage because it is a single source commodity. The public cannot simply sign up with a competitive cable system in most towns and the alternative, 7 channels of off-air television in a market such as Greensboro-High Point, is not very attractive either.

Broadcasters have not been so certain of their fortunes until recently. Now they too feel comfortable making 1,5 and 10 year projections based upon minimum expected gross income. Once you get beyond the mind hurdle of feeling comfortable with predicting your gross income, you are ready to take the next step and calculating predicted cash flow as well. Let's re-look at WGHP in Greensboro-High Point (**G** = Greensboro; **HP** = s High Point).

WGHP Recent Operations

	1982	1983	1984	1985	1986	1987*
Net Revenues	$7.6M	$8.0M	$8.4M	$8.5M	$9.3M	$10.8M
Operating Exp.	5.3M	5.8M	5.9M	7.4M	6.3M	7.1M
Operating Cash FLow	2.3M	2.1M	2.6M	2.8M	3.0M	3.7M
Operating Margin	30%	26%	31%	33%	32%	34%

Give or take a few percent, the station has been returning to its owners around **30 cents** of every dollar taken in **as net profit**; the kind you pay taxes on. That's after every operating expense.

Now, what does all of this mean? Big bucks, of course. Given these financial numbers, the station's new owners are able to project the 'operating margin' for some years into the future. They are able to determine just how long it would take to 'earn back' that $55,000,000 buying price, for example.

Broadcast owners like to hedge this investment bets so they take several different approaches to analyzing the investment return period. One technique is to simply take the operating cash flow and divide it into the amount paid for the station. If the station sells for $55,000,000 and the 1986 operating cash flow was $3.0M, then $55 divided by 3 is 18.3 years. But the operating cash flow is increasing; internal studies for the station project

*/ Estimated numbers for 1987.

it to be $3.7M in 1987, rising to 4.3M in 1988 and $5.3M in 1989. Obviously it will take far less time to pay back the station investment at $5.3M per year than at the 1986 $3.0M. It turns out to be 10.4 years. Should the station's operating cash flow grow to $8.0M, for example, in the next few years, the term will be even shorter.

A man, or corporation investing $55,000,000 in a channel 8 television station in the 51st market in America has to be somewhat concerned about his investment remaining 'viable' for a number of years down the road. He may well not hold onto the station until it pays out from operating cash flow; the recent history of stations is that they sell frequently, usually for more money than they were purchased for.

Remember that programming and network affiliation is the single most important item to the station. Around the programming revolves the ratings, and around the ratings revolves the advertising bucks. In the November 1986 Nielsen ratings for the market, WGHP averaged a 20% share of the TV audience for the full day. By comparison, the top-rated (UHF) indie averaged a 6% share of audience for the same period.

Suppose, just for discussion, that somehow the UHF indie, WNRW, suddenly ended up with the ABC affiliation for the market. There will be an almost instant flip-flop of revenues; the WNRW audience would jump to around 20% for the day period and the WGHP audience would slip, as an indie, into the 6% region.

Now, for additional discussion, consider that WGHP is not the top rated network station in the market. In fact, it is almost 50% less viewed that market leader WFMY which commands 30% of the audience. WFMY is a CBS affiliate and CBS is currently edging out ABC in the program rating races. Most of the professionals in broadcasting believe that the top rated network revolves like a barrel and sooner or later ABC will be back on top. At that time, WGHP fortunes will rise and their revenues will rise accordingly.

(It should be noted that with ABC ratings down, and purchaser of the station buying when ABC ratings are down, the purchaser of the station is buying when ABC is likely to rise and with its rise, up will come WGHP revenues, for essentially the same operating costs.)

Now, what does any of this have to do with networks and satellite fed services? Plenty.

A network consists of 200 or so stations, like WGHP, spread throughout the United States. Each station has an investment and each station owner has to protect that investment and maximize profit for they too, like WGHP, have debt structures to pay off. Take that 6% of the viewing audience being attracted by UHF indie WNRW. If this station (and other indies and cable) suddenly went away, the WGHP viewing audience would rise. Each rise in the viewing audience would be accompanied by a rise in WGHP advertising rates since viewers equate directly to advertising revenues earned per commercial spot. If WGHP could eliminate WNRW and other indies in the market, and turn off cable, it would be a richer investment.

The converse is also true. Nobody has bothered to measure the number of home dishes in the Greensboro-High Point market but let us assume it is not a consequential number; yet. But let us also suppose that it did rise, and that after some years of trying, it reached a point equal to the present WNRW audience; 6% of the **total homes** in the market. That would be 6% of 478,600 or 28,716. That is not an unrealistic number down the road a few years.

Now let us further suppose that on satellite there was **one** network signal available, openly, to everyone. Let us make that network signal WABC, the network owned and operated station in New York City. And let us make a further assumption that all 28,716 of the home dishes in the Greensboro High Point market elected not to watch ABC programs on WGHP, but rather elected to tune in the programs via satellite from WABC. What happens?

Remember those 20% of homes reached by WGHP with ABC programming? Well, **ABC as a network** would still command 20% of all of the homes in the market. But, now 6% of the market, homes would be watching WABC rather than WGHP. That means the WGHP audience share would drop to 14% of all viewing homes.

Needless to say, as that happened, the income coming to WGHP would drop dramatically. Rather than earning $5.3M in 1989, that station could actually end up in the red; all because its audience shared dropped by 30%!

WHO DOES That Hurt?

Seemingly, that does not hurt **ABC the network.** It is still reaching the same number of homes nationwide; perhaps a few million more if you factor in those homes not presently reached by **any** ABC service. In fact, in our example, we have viewers switching for their ABC service from an affiliate ABC does **not own** to an affiliate they **do own** (WABC). If ABC reduced its compensation to WGHP because the audience share numbers had dropped in the Greensboro-High Point market, and then increased its compensation to WABC because its audience share (New York plus satellite) had risen, ABC **the network** is still paying for the same number of customers. Only now it is keeping more of that income inside its own family

of corporations since WABC is **their own** station.

The WGHPs of the world cannot be expected to take this sleight-of-figures lightly of course. There are 600 of them spread all over America and as their revenues dropped, their operations would be curtailed. One of the operations that would be hurt first is their local news operation. Local news operation has become an essential and volatile ingredient in the daily program mix.

When a group is threatened, their first line of defense is the courts. Their next line of defense is Congress. The courts may be able to provide immediate or near immediate relief while Congress can supply permanent relief.

In Congress, broadcasters find a sympathetic ear to problems affecting **local news** production. That is because the local news department at stations like WGHP is the Representative's or Senator's 'conduit' to the constituents. If WGHP was forced to cut back on local news expenditures as a result of falling revenues, there would be fewer news teams, fewer satellite reports from Washington, and a reduction in news coverage. **Congress has a vested interest in keeping the news coverage operational** because Congress wants their voice and their image in front of the local constituents. All of this explains why Congress is an ally of the broadcasters when it comes to keeping the broadcasting operations hale and hardy.

(The cable TV industry recognized this 'fact of life' early in the satellite evolution. By creating **C-SPAN** (The Cable Satellite Public Affairs Network), the cable TV industry was able to hand to Congress virtually free of charge a fulltime conduit into American homes. Cable operators in major markets also play the 'same game' as the local broadcasters, providing programming air time for 'Reports From Washington'; all designed to keep the elected representatives in front of the constituency. Even the home dish industry tried a similar program in the fall of 1985. Through SPACE, they hoped to set up a network to allow Congressmen to address directly small groups of their constituents through the use of transportable C-band downlinks. This '**Satellite Town Hall Network**' died for lack of perseverance but it was cut in the same mold as the broadcaster and cable efforts.)

News item.

"Whether satellite carriers may pick up broadcast signals and feed them to backyard earth stations without incurring copyright liability was left unresolved when the Copyright Act of 1976 was enacted. A copyright infringement suit that Capital Cities/ABC filed (last week) against Satellite Broadcast Networks, Inc. may lead to a resolution of the issue."

So starts a news report appearing in BROADCASTING, the trade bible of the broadcast operators and networks. It goes on:

"SBN began (last month) picking up the programming of ABC's WABC-TV, New York, CBS's WBBM-TV Chicago and NBC affiliate WXIA-TV Atlanta and transmitting the signals to backyard earth stations all over the country by way of RCA Americom's Satcom 2R. The action sent a shock wave of concern through the networks and their affiliate groups, and virtually invited a suit.

"SBN believes it can serve the home earth station market as a 'wireless cable' system, paying fees for a compulsory cable license, as a conventional cable system does. SBN officials contend the definition of a 'cable system' in the Copyright Act is broad enough to include 'wireless systems' that retransmit distant signals to subscribers by satellite. SBN (in March) will start scrambling the signals it transmits and charging $49.95 (annually) for the programming. SBN, which is (to begin) testing its scrambled programming (in February) says it is already receiving advance orders for the service.

The CapCities/ABC suit, filed in district court in New York City, asks the court to order SBN to refrain from retransmitting ABC programs to home earth station owners.

"... (by) retransmitting the signals of WABC-TV to home earth station owners in communities served by (other affiliate) stations, the suit says 'SBN directly interferes with the fundamental right of those stations to have first call on all ABC network programming in their respective communities'.

"... (SBN is attempting) to build a counterfeit network, using our inventory to stock its shelves."

SBN, also known as **Prime Time 24**, can be expected to defend their claimed rights to operate as a 'wireless cable system' in the courts. SBN notes "For years, ABC has shown no interest in providing programming to dish owners and little or no interest in serving those homes itself; but, now it is seeking to deny our right to do so."

Another news item:

"CBS-TV has set (a) July target data to begin scrambling (all of) its affiliate satellite feed(s).... CBS-TV had already announced (late in 1985) that it would scrambling with **Videocipher I** system, which differs from consumer Videocipher II encryption technology now in use by (a) number of satellite programmers...".

The testing of VC-I scrambling of CBS feeds has been ongoing for nearly two years. The service, found on Telstar 302 transponders 15-18 and 20 at various times, is not compatible nor decipherable with VC2000/VC2100 technology. If CBS

makes their target date, by the end of July all 'open' feeds of CBS programming will be gone from satellite.

The SBN/Prime Time 24 project has been 'endangered' from the outset. SBN was formed by three former executives from Westinghouse as Westinghouse was cutting back its satellite related operations. Creating financing to fund three full-time transponders even on F2R is no easy trick. Prices for C band transponders have never been lower but they still cost in excess of $60,000 **each**, per month. That totals $180,000 per month. To that you must add the uplinking expense, which given the best possible scenario is going to come in at $15,000 per month each. Now we have $225,000 per month but no operating overhead for the staff and marketing.

SBN would like to charge $49.95 per year for the three services. That works out to $16.65 per channel per year or **$4.16 per month** for three channels. In other words, for $1.38 per month you receive WABC-TV which works out to **4.6 cents per day per channel**. That is a bargain since SBN is paying the 'compulsory copyright fee', the uplink scrambling costs, and managing the system for you.

Unfortunately, that may be too cheap; there may not be enough cash or market available to SBN to make it break even, much less pay off. Let us return to the basic overhead; $225,000 per month if nobody involved is paid for their time. Just the basic costs associated with uplinking and transponder time.

At $4.16 per home per month, **how many homes** must SBN have on-line, paying for the scrambled three channel package, to break even? Simple division, and the answer is ... **54,087**.

At the present time, 54,000 plus homes is more than twice the number of homes subscribing to any other single programming **package**. That's twice the number of homes taking CNN, twice the number taking HBO and so on. SBN has to be at least **twice as visible**, and **twice as well known**, and **twice as accepted** as the 'other programmers' to make a go of it.

There are other hurdles. SBN/Prime Time 24 is off by themselves on a satellite (F2R) which is well east of the normal viewing arc. A very high percentage of the presently installed dish movers will not go as far east as F2R (72 west; only Spacenet 2 at 69 west is further east). The F2R signals, coming from a satellite located well east of the United States main satellite viewing areas, might be expected to serve adjacent unserved areas as well; areas such as the Caribbean. Unfortunately, for SBN which could use customers anyplace, this is also not the case. F2R signals on transponders 3, 11 and 23 are in fact down even in the state of Florida and at points 600 miles east of Florida 20 foot dishes are required to clean them up. Further east, in the lesser Antilles, not even a 20 footer will work for the three channels.

But the marketing hurdle and the wrong-bird hurdle may become secondary for SBN. At least in the near term. Legal expenses, defending what they have set out to do, against such foes as ABC (and one would expect CBS and NBC shortly, as well) will be considerable. On top of those defenses, each station such as WGHP will be concerned that SBN **not set a precedent** which some years from now could back to haunt their roosts. SBN has tackled the largest, best funded, and most politically powerful foes in America with their three channel operation. How it all sorts out will be no less critical to the home dish industry.

FIND THE PEA UNDER THE HBO SHELL

OLD TRICKS/ New Band

Although it is distinctly possible there will not be a 12 GHz DBS service in the form originally envisioned, anytime soon (see CSD February 1987), that is not stopping some players from jockeying for position. There are presently no strong players planning DBS in North America; the firms holding FCC construction permits to build 12 GHz birds are basically venture capital concerns, hoping to raise money. As we shall see, that also speaks for much of the near term future in Europe as well. Only the Japanese, with a plan for a high definition pay television 'DBS' service seem to have their act together.

Most of the players in DBS now agree that the first or even second generation DBS satellite cannot be 200 to 300 watt per transponder monsters. There has been, and continues to be, a slow maturing of the power amplifier technology required

Ku/ continues page 18

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to generate, reliably, those types of output power at Ku band frequencies. Tests to date, in orbit, have produced very short life amplifiers in the 200 watt and down range, with even half power (100 watt per transponder) experiencing massive problems. To make DBS pay, a satellite should achieve on-station orbit position and maintain it for no less than 7 years and preferably 10 before anything important to the system ceases to function. The life expected at the moment is measured in months, not years, for these 200-300 watt monster-birds.

Thus there will be an 'interim solution', consisting of birds operating in the 50-100 watt region per transponder. By backing down the output power of the Ku band transponders, the size of the on-earth receiving antennas must increase. Pie-plate sized antennas are still a decade or so away although garbage-can lid size antennas may be achievable within the next three to four years.

Tests conducted with the RCA Ku 1 and 2 series birds reveal that 30 inch antennas are capable of producing threshold or slightly better signals in the majority of the USA. RCA of course plans to launch a **Ku-3** satellite, perhaps in 1990 or 1991 and they plan to do that in conjunction with HBO/Time-Life. These firms have formed a company called Crimson Satellites to achieve that objective. The true objective seems clouded at best and many are suspicious of what that objective may be.

HBO, from the very first announcement concerning its planned use of Ku band for program distribution, has maintained that it is not planning **and will not allow** reception of its Ku band services **by individual home dishes**. Very few people believe that statement.

HBO must realize that the cable industry worries a great deal about the proliferation of small satellite dishes on rooftops all over America. In the majority of the USA, even 8 foot dishes would be a cumbersome attachment to a home. A 30 inch dish, on the other hand, would greatly expand the size of the market available for home dish reception. A 12 inch dish, the ultimate by product of monster-power birds in the late 1990s, would virtually eliminate community objection to dishes at all. The cable operators think of themselves as exclusive-run movie theaters; **one per community**. Their contract with HBO prevents anyone else from offering the same movies in **their** 'theater' area. They bring HBO 'bulk business' in return for their exclusivity and they earn a much reduced 'bulk rate' in the process.

Cable operators realize that HBO would no longer need them, as exclusive sales agents and theater operators, **if HBO could go directly to the client homes** with the service. If HBO is collecting $4 per month from 15,000,000 U.S. homes, they have a monthly gross income of $60,000,000. If HBO could collect $8 per month from the same 15,000,000 U.S. homes, they would double their take to $120,000,000. A pie-sized dish will ultimately give them that option. Cable operators know this and worry about where HBO is headed with Ku band.

HBO is now feeding one channel each of HBO, Festival and Cinemax on an RCA Ku band bird. These services are scrambled using Videocipher and they descramble with the consumer version of Videocipher just fine. Those with Musketeer type chips have found no difficulty unraveling these three HBO 'test services on Ku band.

HBO, insisting all of the time that it has no plans to deliver service to home dishes at Ku band, does want cable to begin testing the Ku band waters. To accomplish this, HBO and partner RCA have offered cable operators 3,000 'free' cable dish terminals for Ku band. There is a hitch; the terminals must only be used to receive services approved by HBO (RCA). And the free dishes must only point at satellite approved by the duo.

In the past, when a cable programmer has offered free dishes, they have been snapped up quickly. Of course that was back when dishes were quite sizeable and quite expensive. With even cable operators aware that 3 foot dish systems for Ku band may one day soon be selling for as little as $500 to retail customers, they apparently do not think this is such a wonderful gesture after all. In a word, cable operators do not want free dishes... if there are conditions attached to the dishes. So believe it or not, the cable system operators are not lining up for their free dishes. HBO and RCA are scratching their heads wondering where their offer went awry.

Cable operators are more and more conscious that their exclusive theater distribution rights may not last forever. This worries them because so much of cable's growth in the past five to seven years has been tied to the availability, exclusivity, of satellite fed programming. The cable firms have contracts with HBO (et al) which while not really 'exclusive' carry considerable protection for the cable operator in each community. HBO, after learning that cable operators do not want free Ku band dishes, tested the water with a new proposal.

"Suppose" HBO started out "we create a new type of contract which grants to cable operators exclusive distribution rights to Cinemax, Festival and HBO within your franchise area? Would that help?".

HBO is proposing that **not** HBO, **not** any other cable operator, **not any third party** could 'sell' HBO/Festival/Cinemax within the franchise territory **on Ku band**.

Why would HBO take such a step, essentially ruling out selling direct on their own, if they do not have 'direct home service' in mind at Ku band? Cable operators are still stinging because HBO (and later Showtime) backed off giving cable operators $5 'rebates'. HBO had tried to sweeten the cable pot when they began selling directly to C band home dish owners by sending their franchised affiliates a $5 rebate each month. The cable affiliate received $5 whether he 'sold' and 'serviced' the home dish user or not. Congress found that appalling and focused on the rebate in hearings held during 1986. HBO withdrew the rebate policy in the early fall, just before Congress was to consider a piece of legislation that cable did not like. The legislation was defeated, perhaps partially because of HBO ending the rebate policy.

Cable operators worry that **if** Congressional pressure could force HBO to end the rebate, it **could also force** HBO to change their policy for exclusive franchise territories at Ku band as well. Other cable operators worry that a court might not like the 'exclusive' plan and could overturn it. The way cable sees Ku band, the only way HBO can come out on this one is to either **(a)** not use Ku band at all, or, **(b)** use it but under no circumstances offer Ku band service to any home owners.

HBO is already in trouble there since it routinely offers Ku band service as a 'perk' to various Time/Life and other executives 'at home', (see CSD for February, 1987).

If the North American plan for Ku band 'DBS' or small dish service is not totally clear, the European plan is in full shambles. It all began when the tiny country of Luxembourg decided several years ago to allow an American entrepreneur to create a company to launch a privately owned satellite system. Luxembourg, as a member of the European community, received certain over-the-equator assignments along with the balance of Europe in the 1979 World Administrative Radio Conference (WARC '79). The country, being unable to envision any **internal use** for the assignment, instead viewed the space assignment as an 'asset' to be rented or sold off. The American, fresh from employment with Hughes, saw a golden opportunity. He would create a 16 channel, 50 watt per channel satellite, and sell off the channels on the satellite just as Hughes had sold off the transponders on Galaxy 1 (and 2 and 3). The rest of the European communications community reacted; violently. They had their own all-European satellite consortium (**Eutelsat**) and through their organization they had worked out an 'orderly process' that allowed each country in Europe to participate. Their ECS series birds allocated, for rental, a certain number of Ku band transponders to each country. Some of these transponders are used for voice and data, others for video.

Eutelsat, or in a sense the nations of Europe, are openly hostile to the Luxembourg based plan. The plan was originally called **Coronet** and more recently renamed (after a subtle rearrangement of ownership) as SES-Astra. There is very little they can do to prevent the launching of the SES-Astra satellite. What they can do, and have effectively done to date, is to prevent its use within Europe.

It boils down to something loosely termed 'landing rights'. Suppose, as an example, you had the world's largest super tanker to carry crude oil. But also suppose that all of the nations in Europe collectively got together and told you 'you cannot **dock** at any of **our** ports'. Obviously, you would be precluded from doing business in Europe with your super-tanker. The right to 'land' or be used in a country is quite important. Eutelsat has seen to it that SES-Astra, if it gets signals into the sky, cannot bring them back down (legally) in any country in Europe.

Decades ago entrepreneurs built high powered radio stations on board old tankers and freighters and sat outside the 3/12/200 mile limits of various nations spewing out their radio broadcasts. Such 'clandestine' radio stations endured because the radio services they were competing with had failed to adapt to the changing times. BBC, for example, routinely ignored new rock music for many years even though it was extremely popular with youngsters. 'Top 40 Format' pirate radio stations proliferated in the waters around Europe for nearly a decade. Eventually, the national radio services adapted and some even began to accept advertising (something the pirate stations did from the beginning). The pirate stations died.

But could technology support a '**pirate satellite**' operated out of Luxembourg and designed to spew TV pictures into homes all across Europe? A pirate **radio** station could be assembled for well under $200,000. A pirate **satellite** system could run to $200,000,000. The gamble was huge and for that reason the original Coronet firm that created the concept decided to bail out. SES-Astra came on board to carry on the plan.

Several years have lapsed since the original Coronet proposal. They had no intention of operating a 'pirate satellite service'; they hoped to gain 'landing rights' from at least sufficient European countries to allow them to operate properly. But they were faced with a chicken and egg situation; a closed loop with no exit ramps.

To convince programmers to buy their transponders, ala Galaxy, **first** they had to prove to programmers that the programs would be widely available within European homes. And to con-

vince European nations that they should relax their opposition to landing rights, **first** they had to convince the nations that their new service would not upset existing television distribution systems. Without landing rights they could not sell programmers and without programmers identified, they could not gain landing rights.

The Coronet/SES-Astra plan was to never attempt to be a 'DBS' service. With data from Hughes, they knew that a 50 watt per transponder satellite (like the RCA Ku series) was really very adequate to provide service to dishes in the 30 inch size region. Even down to 2 feet at boresight. Yes, they would have liked to be able to drop down to dinner-plate sized dishes but there were trade offs if they did that. Tradeoffs such as fewer transponders per satellite and shorter operating lives. So they decided that a 50 watt transponder on one end and a 30 inch dish on the other end was really a very good 'first-fit' to launch home satellite TV service throughout Europe. And 16 transponders seemed like as many transponders as Europe would need to spew out movies and sports and news and cooking shows to home dishes and SMATV systems.

DBS has been assigned to one frequency band throughout the world. There are adjacent, non-DBS frequency bands also assigned to other types of use. Just below DBS in the frequency scale is something called 'Fixed Satellite Service' or FSS for short. FSS is sort of like our present C band allocations in North America; anyone with satellite business to do can operate here doing virtually anything he or she wishes. Because it is not considered by definition or law to be a 'broadcasting service' the general rules (and limitations) governing broadcasting enterprises do not apply. Special rules apply.

The '**Eutelsat Convention**' is the relevant law here. This international accord established the rules and regulations for all-European cooperation in space activities. The convention clearly defines something called 'public' (as in broadcasting) and something called 'specialized' telecommunication services.

Eutelsat has argued that while it is technically possible for SES-Astra to operate from the assigned position above the equator without causing interference to other satellite systems and users, Luxembourg and the SES-Astra group are bound to get Eutelsat approval before operating their satellite system. The arguments as to why this is so sound very much like the arguments used by Intelsat.

Eutelsat maintains that if SES-Astra is operated, there could be 'economic harm to Eutelsat'. In other words, under the Eutelsat Convention, Eutelsat is protected from the competition. SES-Astra and others anxious to see the project fly are not so sure that is the case.

SES-Astra maintains that they would be obliged to get Eutelsat approval for their satellite(s) only if their satellites were operated in the **public** telecommunications service. They back this statement up by going to the Eutelsat Convention itself where the various uses and requirements are defined. By operating in the **FSS** frequency band, by limiting their power to a level not generally considered adequate for DBS, SES-Astra hopes to convince the nations in Europe that they cannot be denied 'landing rights'.

Eutelsat is not impressed with the arguments. The mere fact that the satellite is in the 'wrong band' and operates with 'less than the normal power' does not persuade those opposed to the plan to grant SES-Astra the landing rights they seek.

There is some humour in all of this. **Intelsat** has made similar claims when faced with proposals for competitive **international** satellite systems. Pan-AmSat, the would-be operator of a Central and South American regional, private satellite system, faced the same sort of general arguments when it attempted to win approval to operate. Intelsat, the international communications consortium, defended its 'exclusive right' to provide such a service based upon the 'economic harm' which Pan-AmSat might do to Intelsat. **Eutelsat has come down on the side of competition to Intelsat** in the international arena. Some find it difficult for Eutelsat to now come down on the side of protecting their own turf, in Europe, when faced with potential SES-Astra competition.

Intermingled in all of this are the plans of various nations within Europe to create and operate national DBS systems. France is closest with a 4 channel bird and West Germany is close on the French heels. The British have finally adopted a similar plan and all three would like to have dinner-plate sized dishes on the ground rather than 30 or 36 inch dishes. Each of these services is intended primarily for its own nation, although with satellite spill-over there will be ample opportunity for the services to be viewed outside their target areas. None of these programs are likely to launch before the current SES-Astra planned launch however.

The primary threat of SES-Astra is that it is enough higher in power that it can materially reduce the required dish size, and its possible programming content. Through Eutelsat, the individual nations have a measure of control over both the programming content and the way that programming is marketed in Europe. Through SES-Astra, they would have neither.

So in spite of the considerable amount of publicity given to date to the 'rapid growth of TVRO in Europe', the industry there is still in its pre-crawling

stages of development and not likely to learn to even toddle before the SES-Astra case is sorted out. Most observers feel that a healthy, operational, 10 or more channel concentration on the first SES bird must be accomplished before European home dish systems really take off.

Meanwhile on our side of 'the pond', the real issues seem to revolve around 'who will control programming, and its distribution'. If all of the consumer-worthwhile programming is owned and protected by the cable television camp, and they are not obliged to release it outside of their own internal distribution system, how will a **real DBS business** in any form ever get started here? HBO, clearly, would like to create a DBS service using RCA Ku-3 in 'their own image'. The cable operators, now sufficiently worried by the near-miss with C band 'DBS' are not anxious to have the C band threat reappear at Ku band. However, for the first time we are hearing the cable leaders preaching 'caution' and suggesting that if they continue to be uncooperative with the wants and needs of the home dish customers, there might be legislative or FCC reaction to consumer complaints. It is all very troubling to the cable complex, and for now the many ambitious plans of Ku band (DBS) will remain essentially on hold until some middle ground is determined which protects cable but which also allows DBS in some form to appear in North America.

TRANSPONDER WATCH

RECENT REPORTS OF ACTIVITY ON DOMESTIC / INTERNATIONAL SATELLITES

Send your reports to CSD Transponder Watch, P.O. Box 100858, Ft. Lauderdale, FL 33310. For late news, call (305) 771-0505.

COMSAT would like to purchase two 'old', tired Ku band satellites from MCI. SBS-1 and 2 birds are approaching end of useful life and COMSAT claims they can extend life of birds by 6 years using 'Comsat maneuver' which allows birds to drift north and south of equator in figure-8 pattern. This reduces bird station keeping fuel requirement, biggest factor in bird life, but requires that earth stations using satellites 'track' birds north and south of equator in daily gyrations. This makes 'maneuvering birds' unsuitable for small, non-tracking dish applications.

JAMAICAN proposal to establish offshore telecommunications center to process data and handle U.S. 800 number reservation and card order services apparently died on vine. To make plan work, U.S. had to approve interconnecting Jamaica with USA via domestic US satellite. Intelsat also had to approve plan since normally Intelsat has exclusive right to provide such 'international service' to Jamaica or other countries. Intelsat intervened with Jamaican authorities, resulting in apparent cancellation of plan.

FLOATING satellite launch pad is proposed by English firm that plans to anchor platform on or close to equator in Pacific ocean. By being on top of equator for launches, costs of launch can be reduced by 15% or more taking advantage of earth's own 'slingshot effect' at equatorial bulge. Project would exceed initial investment of $150M and involve super-super ship not yet built nor designed with 240 foot tall launch platform on top.

INDIA trying to acquire as many as 5,000 Equatorial Communications C-201 interactive C-band micro terminals. India would establish national data network called NICNET and use Intelsat at first, later its own C band satellites, to interconnect thousands of national sites to single net control center.

PRC is building $50M broadcasting complex to be open in time for 'Asian Games' to be hosted by China in 1990. Center is to provide elaborate up and downlink facilities to Intelsat and regional domestic satellites; COMSAT has contract to oversee design and construction in Peking.

MICHIGAN dish owners are latest to form 'national association' for users of C band TVROs. Calling themselves UOTA (National United TVRO Owners Association), they are charging $25 annual fee for membership and promising discounted programming service rates. UOTA plans to rent VC2000/2100 descramblers for $8.95 per month as well. Information from 616/964-DISH.

SUPREME COURT has denied DBS applicant Hubbard Broadcasting suit brought against Turner Broadcasting. Hubbard alleged WTBS release of programming nationwide violated Copyright Act. Court said 'no case'.

RICHARD BROWN, Counsel for Satellite TV Viewing Rights Coalition, disputes General Instrument claim that rapid jump in VC2000 sales 'proves marketplace is responding to scrambling offerings. Brown insisted "If you look at the jump in sales (of descramblers) from 60,000 to 100,000, it all occurred after the announcement that the Videocipher had been broken...". GI maintain more than 3,000 consumers are having new Videociphers 'authorized' per week.

ZENITH has brought suit against Colorado based Future Communications firm charging misuse of Zenith name and promotional materials. Future Communications has attempted to sell 'flat plate TVRO antenna' concept to dish dealers and is under separate investigation by Colorado and postal authorities.

HOUSTON TRACKER Systems firm has been sold to group of investors reportedly including Echosphere CEO Charles Ergen. Houston recently began shipping Tracker VIII and VII receiver systems which include internal IRD descramblers

from GI. VII model uses UHF wireless remote control, has on-screen graphics, automatic C to Ku to C switching. Tom Ortolf, former Senior VP at Echosphere has been appointed President of restructured Tracker firm.

HOME Satellite Services, headed by Commtek publisher David Wolford, is new 'third party packager' of cable related programming for home dish market. HSS is expected to promote its service through wholly owned Orbit publication headed by Wolford.

MARCH 19th is scheduled liftoff date for re-scheduled Indonesian Palapa replacement satellite using U.S. Delta vehicle. Palapa system has been suffering two-bird operational problems for nearly one year and fears are system may go down permanently at any time unless replacement bird is put into orbit rapidly. Palapa provides Indonesian telephone and television services as well as several other regional national TV services in Pacific.

CABLE industry not responding to Viacom reported purchase valued at $243M of 21 transponders on Telstar 303 satellite. Viacom, owner/operator of MTV, VH-1, Showtime, Movie Channel and others plan to move all of its services from F3R/GI to 303 bird. It also hoped to sell or lease those transponders it will not directly utilize but to date other programmers have shown reluctance to join the move.

HBO also getting thumbs down response from cable operators after offering 'free Ku band dish systems' to more than 3,000 cable system operators. HBO claimed it wanted to 'help' cable industry in transition to Ku band, based upon long term plans to shift all HBO corporate related services to Ku by early 1990s. Cable operators accepting free Ku band terminals had to agree not to use dishes for services other than those HBO approved; cable firms not enthusiastic about proposal.

NORWEGIAN authorities have approved cable systems there adding Super channel and ARTS channel via satellite. More than 300,000 Norwegian homes are affected.

CHINA now has launch agreements signed with Western Union Terasat, Dominion Video, American Pacific Satellite Corp. and a Swedish group. Using the 'Long March' launch vehicle, Dominion Video could be the first to launch using a pair of Ku band satellites which it is proposing to purchase from defunct Comsat STC group. Chinese expect all of their present clients to launch satellites before end of 1988.

ECHOSPHERE is cooperating with state and regional dealer associations by using associations to cooperatively stage seminars introducing new SRD-8000 and SRD-4000 satellite receivers. Florida group recently participated in project and received $50 'donation' from Echosphere for each receiver ordered by a dealer at seminar.

BBC has moved effective date for its 'worldwide satellite television news service' to October of 1988. News service is a part of an overall proposal to place BBC international television service, including news, into operation. No decision on larger question yet.

SES ASTRA, firm planning to launch 16 transponder 50 watt Ku satellites similar in concept to Galaxy 1, leasing out channels to anyone with ability to pay, moving into ground segment promotion. Working with Japanese NEC and others, Astra would like $450/500 range dish systems available throughout Europe when it launches services.

RUSSIAN Proton rocket, promoted as possible launch vehicle for western satellites, had first failure after 35 trouble-free launches. Proton use by western firms is a problem because of U.S. policy which prohibits shipment of American high tech to Russia and launch of western satellites using Proton would require shipment of satellites into USSR prior to launch.

DENMARK is latest European hotbed of defiance against national laws prohibiting use of satellite TV. Four cable networks installed their own dishes to receive French TV5 and English Music Box services without permission. Danish authorities responded by attempting to cut cables from dishes and confiscating receivers. Leading politician then installed dish on his home, also against the law, and urged authorities to remove it. They did not. Other politicians advanced plan to install dish on Danish Parliament in opposition to laws. Danish DOCAT has national 'rights' to provide satellite services but has not cooperated with cable or private homes wanting service.



OPEN Sale of Videocipher descramblers in Mexico is illustrated by this advertisement appearing in Mexico City newspaper.

ANTARES Satellite Corp, RCA Americom and Digital Paging Systems have had their FCC construction permits to build DBS type Ku band birds cancelled. Antares ownership includes Echosphere's Charles Ergen. FCC routinely cancels permits for firms who have not shown 'progress' towards construction. Those losing permits can refile for new permits if they wish.

MAJOR European satellite and cable show scheduled March 26-29 at Wembley Exhibition and Conference Center, London. Show is sponsored by European Satellite TV Association; details from (1) 486-1951 (London).

FRENCH opposition to national plan to cable major segments of country with fiber-optic systems(s). Master plan had approved fiber cable in lieu of coaxial cable because of perceived ability to allow two-way communications, pay-per-view and other addressable techniques. Government is now re-assessing original plan and seems to now be in favor of allowing standard coaxial cable systems for television.

M/A-COM has signed agreement with Dictaphone Corporation that allows for the maintenance over 3 years term of M/A-Com Personal Earth Station VSAT terminals.

SKYSWITCH Satellite Communications Co. is installing a Ku band network for the Adolph Coors Company with voice and data links initially between Colorado and West Virginia facilities for Coors. GTE Spacenet 2 satellite will be used for link.

NORSAT INTERNATIONAL, British Columbia designer/importer of C and Ku band receiving systems, has won contract to provide GTE Spacenet video receivers for 2,100 terminal K-Mart system. Norsat was at one time a supplier of significant parts to the home dish industry.

U.S. COMMERCE Department forecasts significant decline in U.S. home dish sales activity during 1987. Commerce pegs numbers of home systems sold in 1986 at 280,000 (a 60% drop from 1985) and also notes that average selling price was 'down $1,000 per home system during 1986'. As for the future, Commerce believes "in the long run, the TVRO industry will depend on the establishment of direct broadcast service via high powered satellites...". And in the short run, Commerce believes "prospects for growth depend upon video broadcasters offering package programming services and the aggressive promotion of programming".

PICO PRODUCTS Home Satellite Division is offering 'Little Mac' a no frills receiver package compatible with C and Ku band reception system needs. Included is a receiver for C/Ku and an antenna positioner. The receiver is 950-1450 block

input and has a 26 MHz I.F. bandwidth centered on 70 MHz.

BRIGHTSTAR Communications, provider of transatlantic relay services from England to USA will move its services from Intelsat at I west to Intelsat at 27.5 west during 1987. Brightstar believes the move will allow direct access in North America to the European fed service with smaller dishes than is currently required with the I west bird.

GI announced late in January that the number of VC2000 units authorized by the firm for home service has passed the 100,000 point. GI reports that since October, the number of units being newly authorized per week has averaged 2,900.

PANASONIC Industrial is assisting TVRO dealers in 7 regions of southern US by large scale direct mailings going to rural region dwellers. Mailing promotes concept of home dish ownership and directs interested parities to their local dealer for further information and demonstration.

CANCOM (Canadian Satellite Communications, Inc.) is offering home dish owners who are leasing an Oak Orion P decoder the opportunity to purchase the decoder for $435 (plus tax). Earlier, CANCOM offered new subscribers the same Orion P unit for $529 (plus tax). CANCOM is also decentralizing its field operations and turning invoicing and service for home dish customers over to 'Field Service Agents'. Canadians can contact CANCOM at 800-268-2878. Outside of Canada, 514/845-9208 or at 1405 Peel Street, Suite 201, Montreal, Quebec, H3A 1S5, Canada.

INDUSTRY AT LARGE

CORRESPONDENCE, NOTES, REBUTTALS AND CHARGES . . .

CST provides this industry 'forum' for the purpose of allowing members of the industry to comment on industry activities. CSD assumes no legal responsibility for statements made here and those providing such communications are held liable for their statements directly.

MINOR League Sports

I enjoy reading **CSD** each month. I've found many of the articles enlightening. Perhaps, you may be able to help me with my quandry. I know you're currently 'picking up the pieces' on Provo, so if you're unable to respond, I understand.

My corporation, **PQRS, Ltd.**, has many ideas we're attempting to develop. But the idea which I'm placing the most emphasis behind is to start up a satellite channel featuring obscure sports; narrowcasting to an acute degree. I read (not in CSD) that you had been barnstorming the country trying to organize a full-time satellite channel. The article did not mention whether you had abandoned your efforts.

What I have been inquiring about has been smaller NCAA sports, such as soccer, lacrosse, ice hockey, and the American Indoor Soccer Association. Lately I've entered into some communication (Read: they haven't responded yet.) with the two smaller Australian Rules Football Leagues, the WAFL and the SFL. I intend for this to be mostly an occasional video channel, but I won't rule out going to twelve, eighteen, or twenty-four hours a day service. I have some ideas to pad out service if this becomes possible.

There doesn't seem to be a lot of information on how to start a satellite channel. Even the Federal Government, which normally has reams of data available for extremely low cost, wasn't very helpful. (I did get some information on how communications satellites are designed, launched and implemented.) Similarly, cost estimates are non-existant. Even the Small Business Administration was perplexed by my request.

The one constant in all my current negotiations has been that we are seeking nonexclusive, perpetually renewable rights to leagues and teams that currently have **no** national broadcast contracts. In return, we're asking for cooperation in keeping our costs down.

Some specific questions that I have been asked that I still don't have the answers to are:

1) What production facilities will we use?
2) Who will pick up those costs?
3) Will **we** pay for the uplink and satellite time? If not, how will it be split?

I anticipate we **will pay for** the satellite time. I further want to use GTE's Spacenet 2 satellite, which should offer a lesser rate thant he other currently orbiting birds. In addition, it has some Ku-Band transponders which could prove useful.

I really believe in the satellite industry. I believe there are fortunes that can be made in this field. With the current fallout over *"Scramblemania"*, those who were approaching this as a hobby have fallen by the wayside. It has caused trying times for all. I am ready to commit all I have to this idea. If you are looking for assistance, you can count me in. If you can assist me, I'll be in your debt.

Steve P. DeRose
4821 W. Fletcher St.
Chicago, IL 60641
(312/545-4897)

The concept of provide minor league or not-mass-popular sporting events on satellite is potentially saleable. But perhaps more important than who **will provide the events is who will** pay **for the events; i.e. will there be sufficient support from the home dish owners to pay the costs, or will cable have to agree to carry such a service to make it work? Cable's willingness to carry any and all new services offered has declined rapidly now that most of the new services** (such as the shopping channels, Discovery, etc.) **have decided to** 'pay' **cable systems to carry their programming. To get onto any appreciable cable systems today, you have to figure out someway to get the cable operator's attention. At the present time, laying money under their greedy noses seems to be the only message they understand.**

MISSING WGN Audio Services

I have been 'listening' to Boresight program intermittently since November 85 when I got my TVRO equipment. My use of TVRO is different than most of your audience. I am totally blind

and was primarily interested in the delivery of audio services to my home such as the dedicated music services playing all formats 24 hours a day; no commercials and no talk. With this as your back drop, please understand I have a high end system composed of the Arunta Intercepter 3 which is marketed with the audiophile in mind plus the extensive software which allows me direct frequency access and transponder access without screwing around with odd or even etc. Anyway, I am reasonably sure you are aware of the receivers existence.

Coop, in the show aired October 16, stated that the audio subcarriers now on TR3, G1 (WGN) are moving soon to W5 TR 13, and they will be sent in a format not receivable by the conventional receiver. My receiver has one of the largest ranges in the audio spectrum (5 MHz to 8 MHz) but I know there are other things outside of those bands using technology called S.C.P.C. (Single Carrier Per Channel). I have my dealer checking with his distributors to see if I may buy a commercial decoder to receive those services. I also plan in the future to buy "The Hidden Signals book", as soon as I can find someone who would read it on tape for me.

I am upset because of Coop's announcement since recently my heart was broken when the 10 or services run by Studioline Cable Stereo apparently went bankrupt. They were leasing space on the C-Span transponders and now they are gone. I got many hours of enjoyment of these services. The VC2 thing doesn't bother me one way or another as I am not much on that they call movies today so I am not missing much on the premium channels. If at some point in the future I decide I must have HBO or The Movie Channel, I am pre-wired for cable and keep basic cable installed in the house for local channels, so it would be a simple matter to buy the subscription rather than go the VC2 route.

Now if the "Star Station" and "Coast to Coast Country", both are broadcast services on G1 TR3, go scrambled, I will have that bird bath the cable companies are talking about. Tampa Bay radio is a drag and I found it stimulating to wake up to Bob Leonard on the Star Station rather than local fare.

Please help me in this matter.

Mr. Tandy Way
8909 Peppermill Ct.
Tampa, FL 33634

Our October 15th edition presented the problem. Now it is up to our receiver designers to create a solution. AVCOM Of Virginia is, we believe, the first solution out of the box. They have created a special subcarrier tuner add-on box which sells presently for around $900. It tunes those carriers between 100 kHz and 5 (+) MHz which are found on transponder 13 of Westar 5. WGN began testing their Videocipher scrambling system in late October and during at least the initial tests we witnessed, there was no interruption of the subcarrier feeds because of the presence of the scrambling signal(s). However when United Video has completed retrofitting those thousand of dishes now taking one or more services off of WGN/TR3, to W5, TR13, then the audio subs found on TR3 will simply be turned off.

BARRANQUILLA Needs Television

Our company has an interest in making a joint venture to promote and develop a market for direct broadcast systems out of Latin America. We believe that the future of 'DBS' is to provide television services out in the rural areas, out of the limits of the United States where cable television is not presently available. At the present time, satellite television in Latin America is a special privilege enjoyed by a very small number of people. This is a great market here because television operates only a short period each day (3 PM to 12 midnight) and is only one channel or two channels at most. Local stations go off the air two or three times every month because something breaks and they do not have spare parts. Yet six out of ten houses have a television set. We would like to start a DBS service for Venezuela, Ecuador, Colombia, Peru, Panama, Costa Rica and some islands in the Caribbean. We are very interested in hearing from people who can help us achieve this project goal.

Fernando Alvarez
Presidente
F.A. Productions, Inc.
Barranquilla, Colombia

Ah yes, the old 'DBS for South America Game'. **Why not? Readers with an interest in making a** 'Colombian connection' **can contact Fernando at a US address: 1231 George Road, North Bellmore, New York 11710.**

PAL Receivers

Could you advise where I could possibly purchase a modulator for a PAL television receiver system? I would like to feed the video and audio out of a satellite receiver and then be able to feed the RF out of the modulator onto channel 3 on the TV set. What I would like to do is receive the ITN signal from London in color. It is carried on transponder 11, FIR, a couple of times per day but in the PAL format. I own a German Grundig PAL color TV receiver. Since it is not a monitor, I need a way to convert the incoming PAL format video into PAL format RF (with audio) so the Grundig receiver can tune it in. I have looked into simply butchering the TV set to turn it into a monitor but this particular receiver, to get to the point where it would take or accept baseband video (and audio) I would be splitting into the middle of an IC!

Ellsworth O. Johnson
E.M. Johnson Company
364 Coeurdalene Street
Spokane, Washington 99204

Good project. This country is filled with millions of VCR, TV camera et all NTSC cheapy modulators. Our home dish industry has even used a 'few'. Logic suggests that there are millions of PAL format cheapy modulators all over Europe and the Middle East. Logic also suggests that it would not be much of a trick to build up some gadget if we had a starting point with a schematic. Maybe somebody has information telling how you take a standard Radio Shack (et al) **cheapy video modulator and convert it to PAL format use? Write to Ellsworth directly with a copy of your information to** CSD **and we'll publish it for all to use.**

BROKEN Actuators?

I know many dealers are troubled with an increasing inventory of broken actuator assemblies. Many of the original actuator manufacturers are either no longer serving TVRO or they have gone out of business. This places the dealer in an awkward position when a customer's actuator breaks and the customer cannot see the wisdom in purchasing a new, replacement unit. Perhaps we can help. Our company will repair and reship broken actuators in 48 hours time. This includes broken gearboxes and defective motors. Our repair fees are in the $20 to $35 range and we are an authorized service for Saginaw. We have more than six years experience in this area and all repairs units are 100% bench tested to their full load capabilities before being returned. Perhaps we can help some dealers get off the 'spot' with their customers.

Mark C. Porter
S.S. Motor Repair
2800 South Highway 91
Logan, Utah 84321
801/753-5422

Those firms specializing in helping dealers find repairs for any **TVRO equipment, whether in or out of warranty, can be listed here in CSD** at no charge. **We invite all firms**

doing repair work to write to us telling us what they fix, the general range of charges, the typical turn around time and whether your firm is involved in any type of warranty work. We feel dealers need this information and will create an appropriate listing of firms offering service work here. If you are in a hurry to be listed, free, **call Alli Lake at CSD (305/771-0505) with your information.**

INVALUABLE Tool

I have developed an invaluable tool which saves hours of time for the TVRO serviceman who has to operate by himself and with limited test equipment. I call it the SAT Wizard and it creates and radiates a test pattern signal which can be selectively operated at C band, high and low block IFs and 70 MHz. No external antenna is needed; it simply radiates a signal (at C band) to the feed by hanging it at the base of the feed mount. The trouble shooter starts off at 4 GHz (C band) and then moves to the receiver IF in steps and stages, verifying the piece of equipment which is causing the problems. The unit operates from an internal battery source, for 60 hours at a time, and is ruggedly constructed so it can be abused or dropped and still keep on working.

Barry Stewart
NOVA Development Lab, Inc.
1830 Five Chop Road
Orangeburg, SC 29115

A cute, portable tool which is certainly small enough to not get in the way. CSD has not tested the unit so dealers contacting Barry are on their own regarding the product's ability to perform as 'advertised'. **They do place a six month warranty on the unit.**

TURKISH TVRO?

I read Peter Sutro's report appearing in the September issue of CSD concerning the planned scrambling of AFRTS. I agree that it is a real pity that some CBS executive can force AFRTS to scramble. I received my BS and MS degrees in the USA and attended school there for six years. That's how I know that American television programming has high appeal. Or at least some of it! I also know from first hand experience that AFRTS does an excellent job of representing the American 'vision' overseas and I know what an invaluable service it is to those of us living where local TV may not be as dedicated nor as complete.

However, I must correct some of the impressions given by Mr. Sutro concerning TVRO systems in Turkey. At most there may be 50 home dish systems here and most of these are smaller than the five meter size quoted for adequate AFRTS reception. In his report, Sutro quoted a Turkish TVRO dealer as supposedly installing 100 of the 5 meter and larger systems per month. No way! If that was the case, by the time you read this letter, Istanbul should look like a giant antenna farm. I know about such things because I am a Turkish dealer who installs dishes all over this country. The real truth is that we all hope here that AFRTS will one day increase their power so that we can receive the signals properly on dishes 'as small as 5 meters'; in reality we need dishes 7 to 9 meters in size for quality reception.

Ali Guven Unlusoy
Elektronik Muhen disi
Manolyati Sovak No: 35
3, Levent Istanbul 80620
Turkey

Peter suggests that something may have been lost in the 'translation' **when he was talking with the Turkish TVRO dealer at a trade show in Milan, Italy this past September. We checked Peter's notes and what the Turkish dealer actually said to him was:** "IF you could show me how to receive AFRTS on that 32 **inch** DH dish in Turkey, I **think** I could sell 100 per month". **Peter was proudly showing off the Ku band system from DH-Echosphere at the time; a real crowd stopper at the Milian show. As we reported in October, S/A is involved in a big TVRO deal with Turkey and the AFRTS is mixed up in there someplace. Peter promises to sort it out the next time he travels to Italy.**

CALLING Dr. Demento!

Have you ever seen a satellite listing for the Dr. Demento radio show? I believe he uplinks his programs to radio stations around the country from southern California, and the organization is called 'Westwood One'. I am in an area where radio reception is poor and would like to find his feed in the satellite belt. Can anyone help?

N. Iverson
2640 S. 133
Seattle, Wa. 98168

Seattle has poor radio reception??? Come on, now; the next thing you will be telling us in the Cody, Wyoming has poor TV reception. We certainly hope the FCC doesn't find this out; they are operating under the false illusion that everyone **in America has** perfect **radio** and **TV reception, no matter where they live. It is amazing how fast the signals** 'fade' **when one crosses the Potomac. Can anyone help Neil locate Doctor Demento?**

BETTER Mount's

When are the TVRO designers going to create mounts which hold big dishes stable when the wind blows? I am having problems with the (conventional) U.P. Superior 16 foot polar mounts, although the Hz-Hz polar mount from the same firm does well here. I have installed a number of systems, as a dealer, on the islands of Bonaire and Curacao. Using either the 16' U.P. dishes or the ADM 13 footers, we have sparklie-free reception from Westar 5, Galaxy 1, Westar 4, and Telstar 2 (transponder 20; CBS). We have noise on the rest of the satellites here. Also, where can I get a test report on the STS SR-110 receiver? I would like to see a comparison between the top of the line receivers and the top of the line antennas. I would also like for Coop to start his own Superstation, like the people did with CSS (Caribbean Super Station), which headquarters here in the Dutch Indies. I would be the first to submit voluntary payment for his programs. I welcome Coop back and I really depend upon CSD; almost everything I know about this field I have learned from Coop.

John H. Scheideloah
Master Antenna Electronics
Onaweg 4
Willemstad, Curacao

Pole mounted antennas should be 'outlawed' **beyond 12 feet in size. It is simply too much to ask a simplistic pole mounted antenna driven by a linear actuator arm to hold that huge kite stable in winds. A horizon to horizon** (Hz to Hz as you note) **mount is somewhat better because it grasps and supports the dish at two opposite sides. Sometimes we feel that people who design mounts never have to put them up and they certainly must live inside a giant chamber where there is no wind blowing. We constantly invite manufacturers to ship an antenna to out test range in the Turks and Caicos Islands for review. Many do, and they always profit from what they learn. Many more do not;** ignorance is bliss.

SMALL CABLE SPEAKS

Welcome back; as a subscriber from the third issue, I hated the stridency (and whining) of the DDD fiasco. I would not have

renewed had they stayed. It is my fervent hope that with your return the mag can return to the cutting edge of communications technology, and once again be a forum for some bright and creative souls to rub against each other, rather than just another rag for dish (or whatever) salesmen.

In light of that, let's drop all the cute stuff about "breaking VideoCipher." **Does anyone really care?** Would they buy a pirate box? You've made your First Amendment statement, now let's get back to something exciting. I enjoyed reading about how to modify a cheapo receiver to catch the new audio stuff of United. That's the stuff we care about.

If you want to do some hot VideoCipher news, why didn't you tell us in "Too Late to File" that commercial VideoCiphers were going up more than $100 instead of coming down? That's some important news to anyone who does SMATV or small cable, you betcha! I think that paying so much favorable attention to the pirate issues might make it harder for you to get the story straight from the horse's mouth. As I watch VideoCipher being implemented, I recall how I read about it three years ago in Coop's.

There are still lots of fun and interesting things to do with a dish, even if most of it is pay. Yes, I have a consumer VideoCipher; yes, I own a couple of small cable systems; yes, I sell dish programming, in my area only, where I can provide same-day exchange and installation of hardware, just like I do my cable customers. My rates are reasonable, although not as cheap as your survey wants. I have to make a profit, or I will not be able to sell cheap tomorrow. I would like to buy a new pickup this spring and I wish I could do it for under $2000, but I know that the going rate is quite a bit more; I will pay it, since that is the market rate. I'm not going to buy a stolen one. And I'm not going to lobby for pickup-driver rights.

I think the VideoCipher consumer system is a good deal, even at $395 and $2-10 per channel per month, because it provides the legal access to programming that otherwise did not exist. Who really needs four "different" movie services, anyway? If VideoCipher is broken, who is the winner then? In fact, if it doesn't catch on, because of negative publicity and consumer misperceptions, we'd all lose. I'd have to build a half mile of wire to get more than one channel, or ten miles to watch my cable!

By the way, your article on headends is great for the novice, some nice tips for the pros. I do take exception to the title "Get Rich/Quick..." It's more like "Spend a Bundle, Work your Butt Off, Spend Some More, Watch the Money Fly By...Maybe When You Sell, You Can Keep Some."

So, let's return to those thrilling days of yesteryear...with some real stories. How about "My worst franchising dispute" or "Converting an aluminum one-piece into a pyromaniac's ray gun" until some of the electronics Eddies rise to the challenge? We still don't know how the Weather Channel's data works, etc. In programming, what's ESPN and others going to cost us? Will we still be able to watch Crazy Eddie? Thanks for the soapbox!

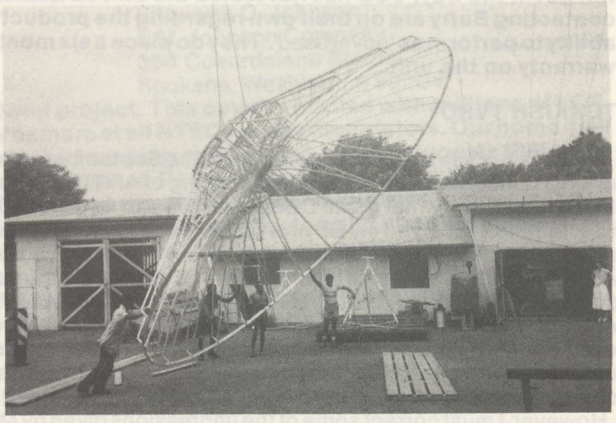
Chris May
Rural Route Video
P.O. Box TV
Bayfield, Co. 81122-9705

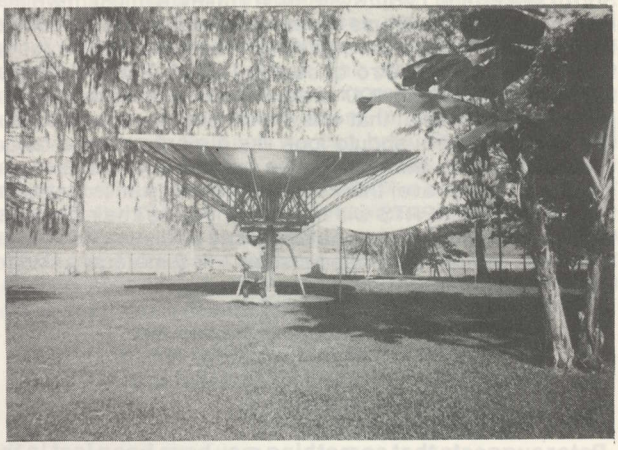
Well thought out points. And the point of view on "who cares if scrambling is busted" **is not yours alone. Certainly there is great danger associated with busting Videocipher. If products or information encouraging widespread abuse of the Videocipher** 'security' **get into general distribution, we** could **find an already lagging industry further beaten into the ground.** That is a risk. **We certainly do not enjoy the 'role' of being an** 'underground newspaper' **(see Coop's Comments, November) and know that each time we have access to, and reveal more about the Videocipher/Oak** (Orion) **technology, there are those in the programming or cable end of this business who think less and less of us. But we in TVRO did not ask for this scrambling war and we have been on the defensive side and retreating since it started when an HBO VP told the world "The skies are going dark ... soon". The 'war' could stop tomorrow; all we ask are reasonable programming charges and an equal opportunity to sell the software. If busting Videocipher helps us to that end, we are closer to victory. If busting Videocipher loses us the war, well, we weren't doing all that well when Videochipher worked either.**

FROM PPG With Love

Our company manufactures and installs satellite dishes. Enclosed is a photo of a crane lifting one of our seven meter antennas to move it for our plating process. After completion, this dish had a 3 kilometer flight with a Pacific Helicopter chopper to its mount. It is now producing perfect television from Australia's ABC service at 12 GHz with an EIRP of 32 dBw. The dish is virtually horizontal since the bird is almost overhead. We placed drain holes in the dish as it would rapidly fill up during our monsoon season! In the background you can see a 5 meter dish fixed on Intelsat at 180 east (west). This is for AFTRS and other services at C band. We also have a 5 meter installed for the Palapa satellite at 108 east. These dishes are owned by Coconut Productions, Ltd. in Rabaul, PNG and feed their 26 unit housing development.

Darragh's Welding & Steel Const.
Pty. Ltd.
P.O. Box 1309
Rabaul, Papua New Guinea





High quality dishes are always fashionable. A 32 dBw footprint at C band would never need a 7 meter dish but at Ku the world is considerably less forgiving.

COOP/ continued from page 5

holed VC2000 units in January **knowing full well** they were contributing to the delinquency of Videocipher.

4) Do the newer version VC2000/2100 descramblers really self-protect against 'hackers'? The two units we have seen before press time have epoxy only over the top of U30. Unlike the earlier noted reported, they do not weigh 'a couple of pounds more' than the older style units.

I doubt one can, by lifting one of each, identify which is the heavier. That's not very much epoxy and while I am not a chemist, several people calling me who claim certain abilities in this area insist that it takes less than five minutes to remove the epoxy from U30. If that globlet of epoxy on U30 we are seeing with early 2100 units **is the counter measure** for getting into U30, someone at GI needs to reevaluate his chemical advice.

All of these elements, and more, are in the pot being stirred. What we learned at the Summit is that other than cloning and musketeering, **there are no widely known** 'software holes' **in the system**. Several people have carefully explained to me just how the cloning 'hole' could be closed and I cannot imagine that after 90 or more days of investigation GI has not figured out on their own how to close that hole. If that is the case, if that hole is now gone, than those who are hoarding VC2000s hoping to sell them as 'vulnerable Videociphers' later on will probably realize a profit. I hope GI as they are drawing up lists of people and firms to prosecute does not overlook these people. Let's see ... hoarding 1,000 VC2000s purchased for $350 each and reselling them later under the table as 'vulnerable units' for $500 each brings in a quick $150,000 profit. Selling 1,000 musketeer chips at the X-ACT dealer price of $200 each brings in about the same profit. **Who is guilty of** 'direct or indirect commercial advantage or private commercial gain' (Section 705, subsection d) in this situation? I think **both** may be. And any dealer who has been told by a distributor "Don't you REALLY want to buy the old style VC2000 because it can be defeated ..." is a potential witness in a case brought against a distributor because the dealer has been 'led' by the seller to a specific product which we all know has certain capabilities. **I'd like to hear from dealers** who have heard this sales pitch with a full identification of those distributors who have been offering these older style units in this fashion.

For the record, privately I believe the circle is about closed on the busting of Videocipher. If there are techniques other than musketeer or cloning, I have not seen them. If GI cannot close the clone hole, it is only because they do not really care about closing it **yet**. If they cannot make musketeer use unpleasant with additional uplink controlled commands, but they can or have closed it with new software in the 2100 unit, I will be very surprised. And that long reported 'stand alone unit' that will function totally outside of the GI authorization stream? I will believe it after I see it, after I use one for a period of time as a test, and after I can sit down with somebody at GI and let them inspect it and tell me after inspecting it "That's it... we are doomed". I am not holding my breath.

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Anderson Scientific Inc.
2693 Commerce Road, Rapid City, SD 57702
Ph. 605-341-3781 TLX: 257631 ANSI UR FAX: 605-342-3178

EXTENDER PANEL Kits

When Hurricane Kate plowed through our sleepy island test site on Providenciales in November of 1985, we lost 22 of 24 dishes. The two surviving dishes were from Paraclipse and David Johnson of Paraclipse wasted no time getting his advertising department busy cranking out damage control advertisements based upon this amazing showing.

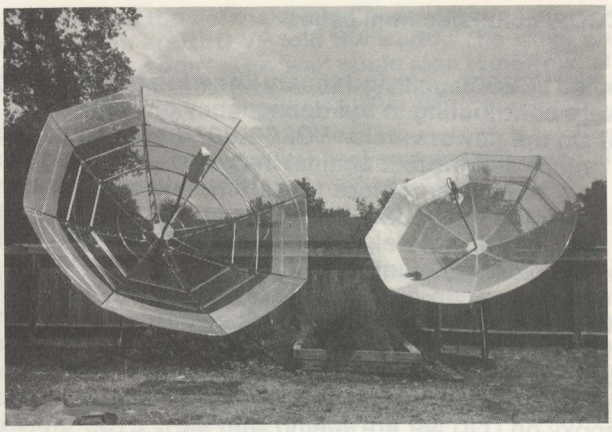
Since Kate we have replaced antennas and the 12 presently operating for our test and research purposes are what we could patch together or replace from the parts remaining after Kate. Some antennas were never found again, not even the pieces. They simply disappeared in the 100 plus winds and undoubtedly landed at sea many miles to the west or north of our beachfront location.

You cannot have an antenna that is 'too big' offshore. As we have written repeatedly, when you think a 12 will do you invariably wish you had installed a 15; where you think a 15 will do you ultimately wish for a 20. One possible answer to this problem is extender panels; outer diameter extensions that fit around a basic dish to enlarge the dish to, one hopes, increase the dish gain. Extender panels are a bit dangerous however because they have to attach to a super structure which was originally designed to support a surface area that is smaller than the extended size. If the dish super structure or frame is somehow strong enough, the dish mount almost always becomes a weak point. Turning a 12 footer into a 15 footer for example crosses over the line where a simplistic pole mount should be replaced by a well designed and well thought out tower or multiple-sided concrete anchored mount.

SMP (Struckman Manufactured Products) in Redding, California (P.O. Box 1686, Redding, Ca. 96099; 916/246-9436) is marketing extender panel kits for the Paraclipse 9 foot dish and the Paraclipse 12 foot dish. The 9 foot extension system turns the dish into an 11 footer while the 12 footer becomes a 14 footer after extension. SMP makes the claim that you will increase the gain of the antenna system by 2 dB with the 11 foot extension, by 1.3 dB with the 14 foot extension. The kit includes all hardware (stainless), extension rib struts, rings, mesh, trim strips and assembly instructions. The f/D on both antennas after extension is .32 and a Chaparral 'Golden Ring' or other .3 region type feed is required after conversion to realize additional gain.

Mike Struckman wanted us to look at his extension kit system so we had one shipped down to the islands. Our first concerns were mechanical; would the existing Paraclipse square-tube mount on the older style 12 foot dishes handle the added wind load? Ditto for the 9 foot antennas. We found two practical problem:

1) Our look angle on FIR is very low (well, around 10 degrees) so where a test 12 footer was barely missing running into the ground for FIR, with the 14 foot extension it could never make FIR. The solution to this would be raising the dish mount to gain some extra height for ground clearance.
2) Our second mechanical consideration was the ability of the mount, raised or not, to stabilize the dish in our forever blowing trade winds. The 12 foot by itself is reasonably stable up to perhaps 30 mile per hour winds and then it begins to gyrate perceptibly. The addition of the added sail area dropped our wind speed to 20 miles per hour; anything above that and the antenna bounced around. In a fixed application where the dish stays on one satellite, the outer edges of the dish could be anchored with ground stays. For a dish with a mover attached, this would not be an acceptable solution.



EXTENSION panels from SMP on 12 foot and 9 foot Paraclipse models. Wind and the strength of the mount are the main obstacles to a successful installation.

There is a measurable decrease in antenna beamwidth when the dish size is enhanced to 14 feet and this only complicates matters. A small movement that the wind causes didn't push the antenna beamwidth outside of the main lobe previously; the same small movement with the 14 foot aperture causes a loss in signal. This only reinforced our long held conviction that once you graduate beyond 12 foot in size, you are asking for antenna stability problems if you try to anchor the dish to a single piece of pipe stuck into the ground. This is one of the reasons why Paraclipse with their CD (cog drive) 12 footer provides a bracing system for the 12 foot dishes. Even a 12 footer in a windy environment will bounce about, on and off the bird with the main lobe. Alas, there is no such thing as a free lunch or a free mount.

The kit itself is well thought out and Struckman spent several years working for Paraclipse so he should be able to produce extension panels for a product which he is intimately familiar with. The assembly presents no unusual problems and anyone who understands antenna basics will have it operational in a short period of time (perhaps an hour to 90 minutes).

There is additional gain with the extension panels, and that after all is why you are spending money and taking time to try out something like this. The 2 dB additional gain for the 9 foot extension may be a tad on the generous side; the 1.3 dB for the 12 to 14 extension is verifiable provided you can hold the dish on the bird without wind problems.

SMP markets this pair of products directly to TVRO dealers and through a handful of distributors. **Promar** in Tampa, Florida is well positioned as a distributor to service the market in the Caribbean and handles the product line.

Our observations in summary form are as follows. Additional gain is there but additional mechanical problems are also there. A dish that is reasonably well

protected from the breezes would benefit from the addition of the extension panels; one that receives a constant wind pounding would be a mixed blessing (better when the wind is not blowing hard; worse when the wind is blowing). If one has a 12 foot Paraclipse that is used in a stationary (fixed bird) application allowing you to anchor the antenna with extensions from the side to prevent wind bubbling, as in an SMATV application, the added gain would be a worthwhile investment.

'After-market' products in any field always fight the battle of providing useful benefits for a product versus somehow compromising some other aspect of the product. Extender panels for satellite antennas accentuate this age-old problem and the trade offs are real. SMP is talking about producing some really large mesh type antennas (20 and 24 foot aperture) and at the moment there is a very limited selection beyond 15 feet for reasonably priced systems located in weak signal regions. They should be encouraged to pursue this product approach because you can never have an antenna that is too big. You **can** have one that is too big for its design, however.

SUMMIT Humor?

Paranoid: "Characterized by oversuspiciousness, delusions of persecution". Many attending the Descrambling Summit suffered from paranoia.

"**Those three guys from Canada** staying in the room next to me are plotting to steal technology" reported the worried attendee. "I sat up half the night listening to them plan how they were going to get their hands on those European chips long enough to read out the programming on their portable computer".

This one turned out not to be paranoia; the 'three guys from Canada' did try to 'steal' the chips and there was even a counter measure program to '**allow them**' to 'steal' three chips 'specially programmed' for self destruction.

A principal from one of the musketeer outfits operating in Canada:

"**We had a strange phone call today** to our office. Somebody on the phone said 'This is a special message from THE BIG GUY' and he says 'shred it all' ... (pause) ... and they promptly fed ALL of the records into a shredder and destroyed every single record we had!!!".

And there were the 'quiet attendees' who kept to themselves, attending all of the sessions but never entering into conversation. "**See that guy over there?** I think he is a spy for GI. He just sits there taking in everything said, but he never talks to anyone. He opened his brief case and I saw some circuit boards in there. Do you know who he is???"

We checked the fellow out. Inside his brief case were a pair of circuit boards, as described. He gladly explained the boards to us.

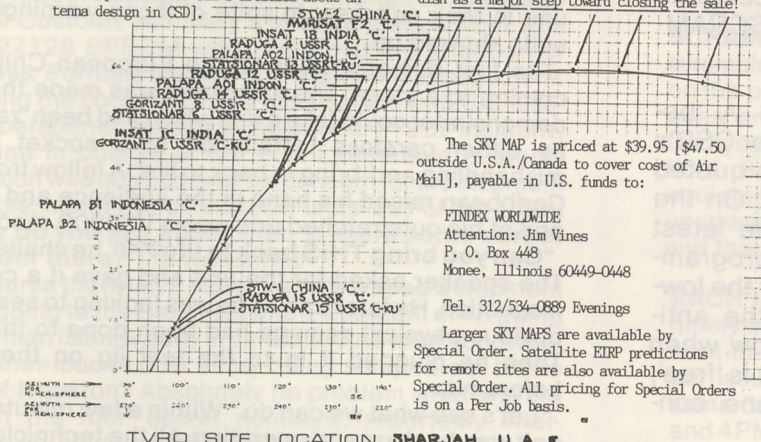
"**I have been working on a stand alone box**, a replacement for Videocipher. I have the full set of boards working except for three devices; U2, U3 and U4.

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Tel. 312/534-0889 Evenings

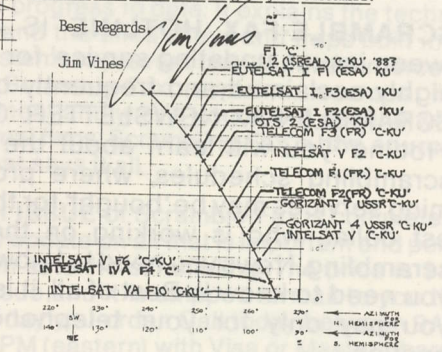
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Best Regards,

Jim Vines



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PREPARED FOR SIGMATECH GULF
PREPARED BY J. K. VINES
DATE 11 OCTOBER, 1986

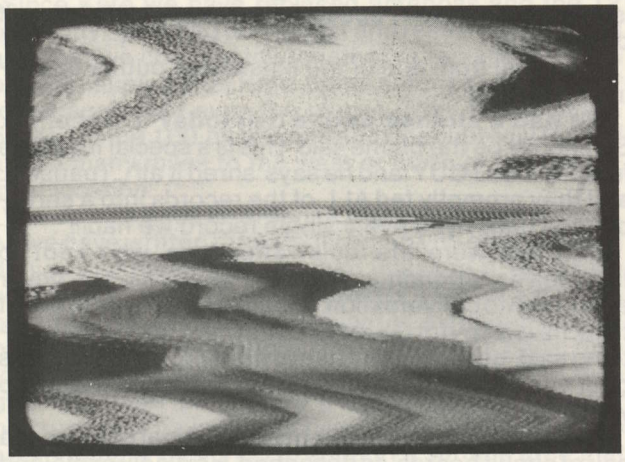
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I came here hoping to find somebody who could help me finish the project. I just don't understand what they are doing with U4." At the end of the Summit, he still didn't know what 'they' were doing with U4. He probably never will know.

"There's a guy from the FBI here. He got drunk last night and showed his badge to the taxi driver." That sounded serious. First we went up to the fellow who was standing talking with a woman; she turned out to be his wife. After small talk, we found the taxi driver, a lady, and asked her to confirm the story. She did. So we returned to the chap who had a heavy southern accent. Fearing no retribution we said to this man:

"Last night you got drunk at the restaurant and on the way back to the hotel you whipped a badge out of your pocket and showed it off to the lady taxi driver. Can you show me that badge???"

The fellow turned six shades of red, obviously embarrassed. He motioned for his wife to join him as he fumbled for his wallet.

"Remember when we came back from eating last night" he asked the lady. She did. "Well, remember when I reached into my wallet and showed my badge?" The lady broke out in laughter as the man produced the badge. There it was, a 'toy badge' that said he was a member in good standing of the f**B**i.

"I should have thrown this badge away years ago; whenever I bring it out, it always causes some sort of incident!". The lady confirmed that she was frequently embarrassed by her husband's 'toy badge'. We shared our findings with our own 'chief of security'.

"What he didn't show you, in his other pocket, was the real f**B**i badge that he flashed last night" said our concerned friend. Oh well, back to the federal courthouse.

Attendees had been warned, told in advance, 'do NOT transport any VC2000 units with you when you come to the Summit'. We felt that until there was a much better 'official statement' concerning the position of the U.S. Customs service concerning VC2000 units, there was no reason to chance somebody being caught with a unit in their suitcase. In spite of those warnings, two units showed up.

The first demonstration of the European Chip was coming to a close. The statement was made that the demonstrator could take a unit which had been 'zapped' by either careless installation of a socket or by mishandling and 'bring in back to life'. A fellow from the Caribbean raised his hand in the audience and at the end of his outstretched arm was a VC2000 module.

"Can you bring THIS back to life???" he challenged. The speaker asked for the unit and gave it a cursory inspection. He later told us he was looking to see if any obvious physical damage had been done to the unit. Then he plugged it in to the test jig on the table before him.

"Let's see what we can do." Within a few minutes, the unit **was** back up and operating. All the technician had done was plug in a series of his 'magic chips'."

"Can I have it back, now, working?" he wondered. Unfortunately, no. The European Chip demonstrator made a policy statement. "None of the units we modify here are for the real world; what we show you is for test only and demonstration only. I will have to return it to a 'zero-memory' state before returning it to you." And he did.

Not terribly funny of course. In the final shakeout of the mystery of the European Chip, most had forgotten that a dead unit brought to the conference in the hope that it could be repaired **was indeed repaired** before everyone's eyes. The European Chip might ultimately turn out to be far less than as represented. The 'miracle cure' of the totally unsolicited unit from the audience would remain a mystery.

The second VC2000 unit brought to the Summit came down on the airplane with the attendee. It came from Central America, and it had originally gone from the USA **to** the central American country, then **back to** the USA with the attendee, across the USA to Miami, and finally down to the Turks and Caicos Islands on a chartered aircraft. It was shipped all of those places as excess baggage, in a box that plainly said "M/A-Com Videocipher' all over it.

"I brought it to have it 'fixed'" said the attendee "and now I understand I should not have brought it with me at all and that it was illegal to carry it down here. What should I do now???". The large box was tucked under his arm. We suggested he get it 'out of sight' since nobody wanted to be seen even touching one of the 'foul things'. He obliged but started anew the next day. We were concerned how he might get the box home again, **back to** Florida on the chartered jet, **across** the USA to California and then down into Central America on a commercial airline.

"But I want it fixed!" he continued. "This box will have traveled nearly 10,000 miles since I left home and I am not going to take it home still in the original factory condition!" He wandered off to find a speaker on the program whom he hoped to convince to 'fix' his box.

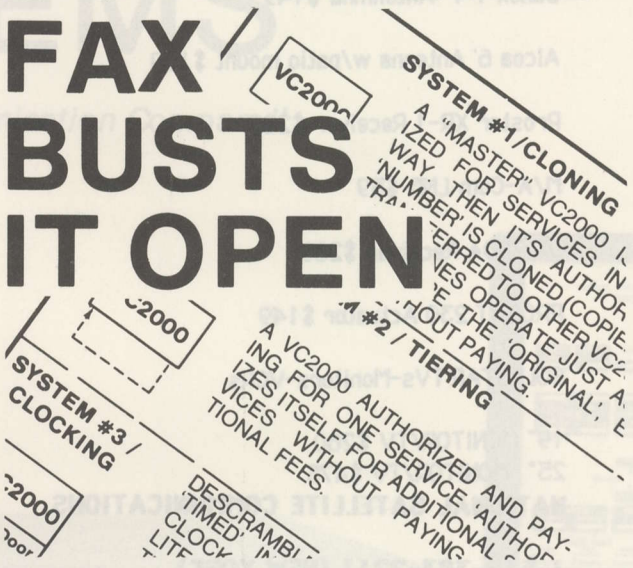
We next spotted the box being loaded on the Sun Coast jet back to Florida. The date was January 19th. Yup, that was the flight which ultimately would be the subject of an extensive investigation and detention of attendees by U.S. Customs. While the U.S. Customs was busy trying to grab ahold of every EPROM chip they could catch from that flight, a M/A-Com Videocipher model VC2000 would drift through the baggage of U.S. Customs with nary a second glance. That was 'one' 27128 EPROM which escaped the attention of customs. Perhaps there is some sort of message here.

(During the course of many discussions with U.S. Customs personnel, following the January 19th 'incident', the man in charge of the Fort Lauderdale customs operation was quizzed over his concern for the shipment of whole, factory fresh VC2000 units 'out' of the U.S.A. **"Why do you ask about that; is there some sort of problem there?"** he wondered.

Of course there isn't; hadn't we **witnessed** a shipment of 96 going to the Bahamas and a shipment of 48 going to Cayman Islands early in January? And what about that container-load (5,000 units) being shipped out to the Port of Houston? Absolutely no problem whatsoever!)

When the four 'secret numbers', reportedly intercepted in chips purchased in Hawaii, surfaced and there was a strong **belief** these secret 'test numbers' would be found inside of the European Chips that was perplexing to the people with musketeer and clone technology, a call went in to GI to have the 'test numbers' reported, and turned off. The plan was that **if** the European Chip was indeed using such 'stolen-from-GI (M/A-Com) numbers', they **should be turned off** before

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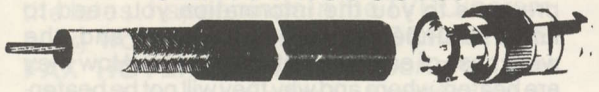
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some innocent consumers purchased chips using this 'dangerous technology'. The musketeer people, for example, worried about the public being 'ripped off' by chips that could be shut down on the stroke of a computer key.

"WHEN were these numbers stolen from the factory" worried the top GI person on the other end of the telephone. "Was it **before**, or **after**, September 29?". The man was genuinely concerned because it turns out that GI took over full responsibility for the factory on that date. If the numbers had escaped **prior to** the 29th of September, then M/A-Com could be blamed. But, if it happened **after** the 29th, the security failing would be GI's. We were told that it is called 'CYA' in the big business world. Since we couldn't find anyone willing to 'fess up to the theft, we had no luck determining when the secret numbers **did leave** the factory.

And then there was the 'Club Med' problem. For those joining us after the curtain has raised, Club Med is a hotel and resort facility down the beach perhaps 1.5 miles from the Island Princess Summit site. It is a more or less pleasant 25 minute trek along the pure white sandy beach. About halfway between the 'IP' and Med is where the Coopers live. Several people, from the home dish industry but not associated in or concerned with the Summit itself had chosen mid-January to visit the Coopers. They were on Provo coincidental to the Summit and spent most of their days lounging on the beach in front of the Coopers.

Each day after a hard day at the Summit we asked our house guests what THEY did all day.

"**I got in four hours of sunshine**" was a typical response. "I saw four pair of watermelons, six dozen peaches, a half dozen tomatoes and three carrots. Oh yes, I saw one ear of corn." Our friend was not into vegetables; he had worked out a scientific 'system' to keep track of the nudes wandering by. He rated the nudes by the size of their appendages and kept a written record of each for each day he was here. He was especially fond of watermelons.

In our water front cabana building is a rope hammock. It is a nice spot to relax and watch the surf roll in, or the nudes walk by. Out of breath, our guest rushed to the kitchen as we were preparing to sit down for lunch.

"**Come quickly**" he urged. "An ear of corn with two attached tomatoes is attacking a pair of watermelons on your hammock. You'd better hurry though because I think the watermelons are so heavy that the hammock may bust at my moment!". Out normal luncheon crowd of a dozen or so raced towards the Cabana just in time to witness the ear of corn being husked, the tomatoes being squeezed crashing to the tile floor below.

With 24 eyes peering intently at the rumpled vegetables lying on the tile floor, the couple grabbed a small, canvass tote bag apparently holding their clothing and disappeared at a brisk pace down the beach. Our inveterate vegetable watcher summed it all up:

"I never saw an ear of corn turn into a pickle so fast before". Another observer offered "I never saw watermelons bounce so much without losing their seeds". All in the day of a vegetable watcher on Provo's beach I suppose. Perhaps the U.S. Customs guys in Fort Lauderdale could get transferred to Provo to inspect our produce on the beach. I'd trade an EPROM chip for a pair of watermelons any day of the week.

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